

COAL AGE

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Meeting the Situation

BY FLOYD W. PARSONS



HERE can be no reversion to the standards of industry prevailing before the war, and few people desire that there should be. The so-called common people—those entirely apart from the capitalistic class—are going to get an increasing share of the good things of life. The chief matter of concern is that the changes which are to bring about these new and desirable results shall proceed in orderly fashion along sound economic lines. Our progress toward a new day must be through evolution and not by revolution.

Our minority class of reactionaries might as well try to stem the ocean's tides as to block the coming of a new era. Aside from the cause of justice, they fail to note that unionism has increased to a point where it only has to become political and fuse with the Socialists to hold the balance of power. It is not the workmen but the employers today who are lingering on the shore of doubt. They are mentally unprepared to meet the changing point of view of their employees. They must be educated out of the belief that industry will some day return to the old basis of "hiring and firing." They will have to learn that the manager of a concern is not the exclusive boss.

The one sure way to feed anarchy is to depress wages without regard to the cost of living. Give us a protracted period of unemployment and state Socialism will come in a hurry. There is but one safe road ahead, and that is the highway of full-time production and satisfactory working relations. Never in our history has it been so necessary for the Government to undertake great national projects, and never has Washington been slower in starting. The Nation is waiting for a stimulus, but Uncle Sam refuses to administer the potion.

The solution of the labor problem is not a thing by itself, but a question of complex nature. The war taught us that money alone will not hold men—companies that paid the highest wages in 1918 had unusually high labor turnovers. The largest turnover

in the country was in a steel plant that paid high wages, in addition to giving large bonuses. The second largest turnover recorded was in a shipbuilding yard where record wages were in force.

It was also discovered that "speeding up" does not permanently help production nor hold men. The offers of large rewards resulted in spurts that were always short-lived. Reactions followed with a regularity that was convincing. The managements found that the steady worker is eventually the most valuable. The ideal conditions prevailed in shops where "pride in work" was considered more important than employment "methods." The best records of continuous individual production were in plants where employer and employee worked together, and where there was no suspicion on the part of the workmen that the owner was getting undue profits. It was in such plants that the labor turnover made a highly creditable showing.

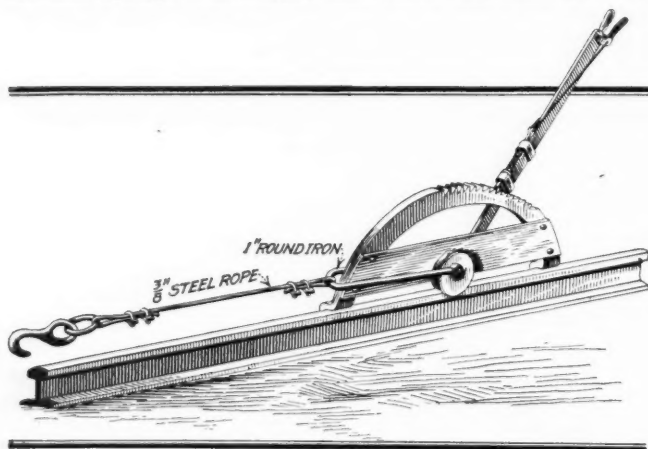
If the war has taught nothing more than that money is not a universal cure-all for labor troubles, it has done some real good. Labor demands a recognized position, and corporations have got to give way to the yearning of their men for a place in industry equal in dignity to that of the employer. Wages may be used as an excuse, but the real fight of labor is a struggle to obtain a recognized position in society.

Let us no longer damn all unionism because a few of its representatives are demagogues. Every movement, no matter how laudable, is likely to occasionally get off the right track. What is required is patience and forbearance, with a complete understanding by capital that unions are results, not causes. We will have peace and plenty instead of boiling discontent when there is a healthy understanding between the parties to industry. The man must not be made to feel that he is the assistant to a machine. He must be permitted in some way to share in the fruits of good work. He must be made to feel that he can wear a white collar without being an object of curiosity to the balance of society.

IDEAS AND SUGGESTIONS

Device for Holding Cars Until They May Be Attached to the Cable

Considerable trouble was experienced at the mouth of a certain mine with the landing of trips and in attaching the trip to the plane rope, especially on snowy and rainy days. Before the little device here shown was devised sprags were used; and when the rails got wet



DEVICE FACILITATES THE HANDLING OF TRIPS

and the cars would slide, sand was necessary in order to prevent them going down the hill. To take out sprags on sand took up too much time. The device finally employed is shown in the accompanying illustration. The grade at the landing is 3 per cent. against the loads, 15 cars to the trip, 4 tons to the car. The cars are steel and weigh 3200 lb. each.

Fiber Rope Little Weakened by Frost

A recent note states that "Frozen Rope Causes Accidents" and that the rope is made brittle by freezing (*Coal Age*, Vol 15, p. 563), adding that the rope is weak. The following quotation from the *Engineering News-Record* justifies all these statements but qualifies the last as to the weakness of the rope.

"A recent test indicates that freezing does not, as has been generally believed, greatly lessen the breaking strength of fiber rope. Four specimens were cut from a 3-in. manila rope. All were spliced at both ends with an 8-in. splice. The length between the splices was 6 ft. Two specimens were soaked in water for 45 min., then exposed to an 18 deg. temperature from 5:30 p.m. to 9:30 a.m. Both were stiff with frost when tested. The other two specimens were kept unfrozen. The elongation, at 50 per cent. of the breaking load was 1½ in., and at 80 per cent., 2 in. It was the same in all specimens. The breaking strains were, for the frozen rope, 10,000 lb. and 10,900 lb., and for the unfrozen rope 11,000 and 11,300 pounds."

This experiment was conducted by Fred A. Jenks, Plymouth Cordage Co., Plymouth, Mass., to answer an inquiry by the editor. Mr. Jenks comments as follows:

"The results were rather surprising. It was expected that the unfrozen rope would show comparatively a much larger breaking strain. As soon, however, as pull began to be exerted on the frozen rope the frost particles began to break up. After the rope had broken, the portion under stress was absolutely clear of frost, although in the splices, where the strain was on the double, the rope was still somewhat stiff from frost, and the ends of the tucks were completely frozen.

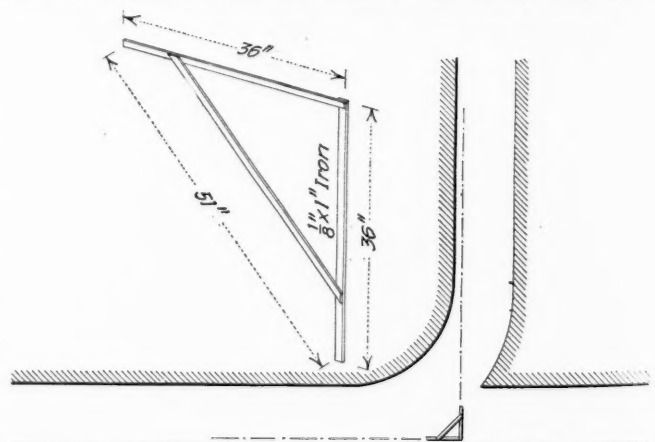
"Between pulling centers there was practically only a damp rope at the time of rupture. The pull had not only broken the frost crystals, but the heat generated by the friction in the strain and breaking of the rope had melted the frost. However, despite the showing made by the tests, everyone who has handled frozen rope knows that it cannot be as easily handled or run as freely over sheaves or used as well over capstans, and that it is much more difficult to secure. These facts alone constitute good reasons for protecting rope from the effects of frost."

Turning Off an Entry Without a Transit

BY GAS INSPECTOR

Worley, Ky.

Many a mining man has been confronted with the problem of no engineer and no instrument, while half a dozen places needed turning off at once to avoid delay and other costly annoyances. The following description covers a method I have followed for many years, one that has proved successful and avoided the delay entailed by waiting for an engineer to arrive. It has proved to be so near correct that no expensive changes had to be made when the transit was finally employed.



METHOD OF USING SQUARE FOR TURNING ENTRIES

This method necessitates the use of a 36-in. square, readily made in the blacksmith shop out of ½ in x 1 in. iron, as shown in the diagram.

Sights are taken from the entry back plugs, and by the use of short strings and two plumb bobs the entry line is projected to a point opposite that where it is desired to start advancing, in the new passage. Here

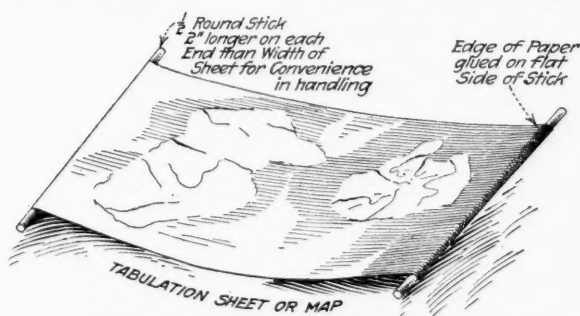
place two knife-point dots on the roof or on a plank, and locate them not over 36 in. apart; then with a chalked string make a straight line from dot to dot; when one arm of the square is placed on this chalk mark a third dot mark at the side and near the end of the other arm gives a right angle. On the second and third dots, or marks, plugs and spads may be placed to direct the new place, be it room or entry.

If the new place is to be an entry, a change can be made in its turning so that it will form an easy curve at the entrance yet still retain the guide of the line established in the manner just described.

Wooden Edge Protector for Maps

BY ROY H. POSTON

Long maps, blueprints, and charts which require handling soon become frayed or torn unless the edges are protected. Frequently only one copy or set is available, and the destruction or obliteration of it would cause much inconvenience. One method of insuring proper



HOW TO PROTECT THE EDGES OF MAPS AND CHARTS

protection against such possibilities is to glue pieces of half-round wooden stick to the two opposite edges of the print, after the manner shown in the accompanying sketch. This permits the print to be rolled from either end, and thus avoids creases caused by folding, in addition to allowing greater convenience in showing any desired portion of the print.—*Engineering and Mining Journal*.

Why Not Avoid Traverse-Table Troubles?

BY R. DAWSON HALL
Associate Editor, *Coal Age*

Many traverse-table annoyances are due to the fact that the transit man does not have to traverse his own notes and feels no responsibility in consequence. He could save the officeman a lot of work if he would arrange, as far as possible, that the directions of all courses should lie an even number of degrees off the meridian and that the length of every course should be an even number of feet. Even where some bearings must, in the nature of things, be partly given in both degrees and minutes, and in feet, tenths and hundredths, there is no reason why all the courses should be so contrived. By simplifying the surveys we can save the length of the bearing notes to be entered on mine maps. Such bearings take up not only time in the office but space on the map. They often spoil the appearance and legibility of a mine plot.

The layout of the mine underground can often easily be made a little bit off the true butt and face. In fact the direction of the face is not readily determined. The engineer usually has some face heading running on a known bearing, and he parallels that in another head-

ing when laying out a new mine. It would often be just as easy to make his butt headings run 60 deg. east of north and then half the traversing could be done by mental arithmetic. In any event there is no sense in standardizing on N59°/48' E or some similar assumption, as likely to be erroneous as it is to be correct.

Much of the time in the office is wasted in trying to reconcile differences in the work of different transitmen or to discover why some one transitman does not arrive twice at the same result. Sometimes the whole series of bearings is corrected to make a survey "close," and new bearings are calculated. This cannot, of course, be entirely avoided, because the mensuration of distances by taping or stadia reading cannot be accurate.

There is no reason, however, why azimuths should not be accurately measured if the transitman will take the necessary care to set his instrument on a steady base, keep his transit in good adjustment, and read azimuthal bearings on the vernier. Mine-property surveys should tie to the minute and should usually close within two feet. They will not necessarily, of course, be correct to that degree as far as distances are concerned. All that a perfect tie shows is a uniformity of error in measurement throughout the length of the line surveyed.

It is a fact, not usually known, that the largest errors in surveying, outside of faulty records, arise not from erratic taping but from mistakes in the mensuration of angles, owing to the shifting of the transit between the fore and rear sights. An indifferent closure means a rerunning of the surveys with a new record of distances and bearings slightly different in azimuth and distance from the first. This makes the calculation in the office slow and burdensome and the record of the survey on the map, a bristle of figures.

Uses for Empty Carbide Cans

BY E. P. HUMPHREY
Upper Lehigh, Penn.

Several uses can be made of the 100-lb. tin carbide containers, instead of throwing them away. They have a small refund value, but when the freight is paid it amounts to practically nothing. One use is to place them in the machine shop so that the machinists can put their turnings and borings into them, one for each kind; and then, when a car of scrap is to be loaded, the filled cans are placed in this car. The blacksmith also should have some for his scrap ends. This practice is not only a great labor saver for the mine or shop operator, but also for the receiver of the car, as it greatly facilitates unloading.

These cans may also find place in the shop, breaker or tippie as receivers for dirty cotton waste and wiping cloths. Some reclaim the cotton waste, and the oil residue is used on gearing. A few cans of this oily waste are handy in the winter time for thawing pipes. A locomotive fire may be easily started with it, saving good waste and oil which the engineer is likely to use in order to secure a quick, sure fire.

Another use lies in substituting the cans as bags for carrying feed to mules in the mines. They can be easily cleaned and dried, and with the screw top are moisture and rat proof. This feature is especially useful in the small mine, where there may be only one mule that is cared for by the driver. The tendency when bags are used as is the ordinary practice is for the feed to get wet and be left out for the rats.

Coal Resources of Western Canada—I

BY JAMES WHITE

Assistant to Chairman, Deputy Head, Commission of Conservation, Ottawa, Canada

SYNOPSIS—British Columbia, Alberta, Saskatchewan and Manitoba together have an actual coal reserve of 412 billion tons and in addition a probable reserve of 781 billion tons. Of the first, 669 million tons in actual reserve is semi-anthracite, the proportion of volatile matter in which is about 12 per cent. The lignites out-range all the other coals, there being 383 billion tons of lignite and sub-bituminous coals in actual reserve. Some of the lignites have nearly 24 per cent. of moisture, of which, however, air drying sometimes largely rids them.

THE principal fuels of Western Canada¹ are coal, natural gas, petroleum, peat and wood. Electricity, to be generated by water power, will serve, also, as a substitute for fuel. Coal is, of course, much the most important fuel of Western Canada. It ranges in character from the lignite of the prairies to the semi-anthracite of the Rocky Mountains. Many of the following facts are taken from the "Coal Fields and Coal Resources of Canada," by Dr. D. B. Dowling,

¹For the purposes of this paper Western Canada is taken as including Manitoba, Saskatchewan, Alberta and British Columbia, but not including Yukon or the Northwest Territories. The article is taken from a booklet issued by the Commission of Conservation entitled "Fuels of Western Canada." Everything not relating to coal is eliminated.

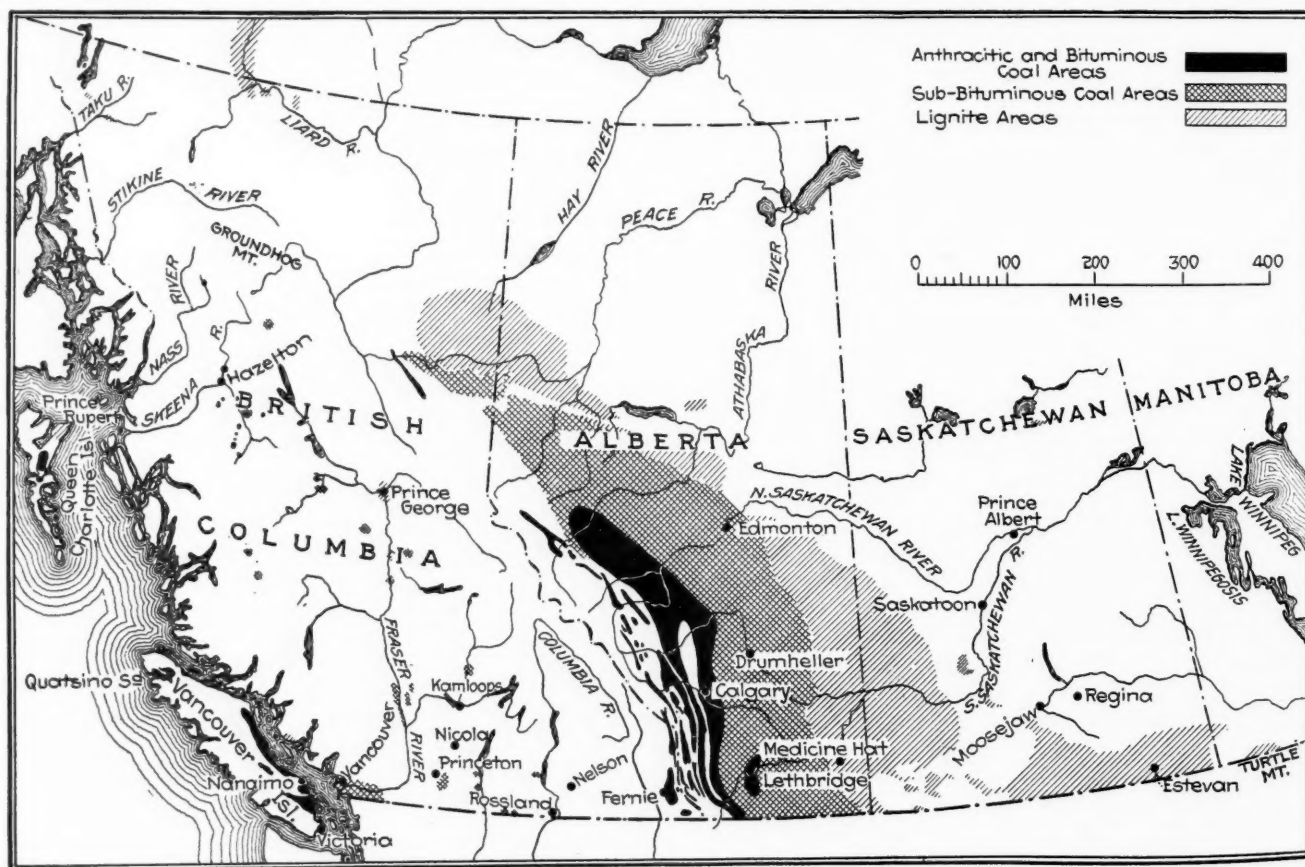
of the Geological Survey of Canada. Included in these is the statement as to the coal reserves of the provinces that are included in this area. The monograph quoted divides the reserves into two groups.

Group I includes all coal found in seams which contain not less than one foot of merchantable coal. However, when any seam occurs more than 4000 ft. below the surface it has been excluded from the calculation. The estimate also includes all the coal in workable submarine areas. This group, Dr. Dowling remarks, includes all the coal of economic value that is contained in seams of workable thickness situated within minable distance of the surface.

Group II includes the coal in seams which contain not less than two feet of merchantable coal wherever such seams occur at depths ranging between 4000 and 6000 ft. Such seams are situated beyond present minable distance of the surface and have not been considered in this paper.

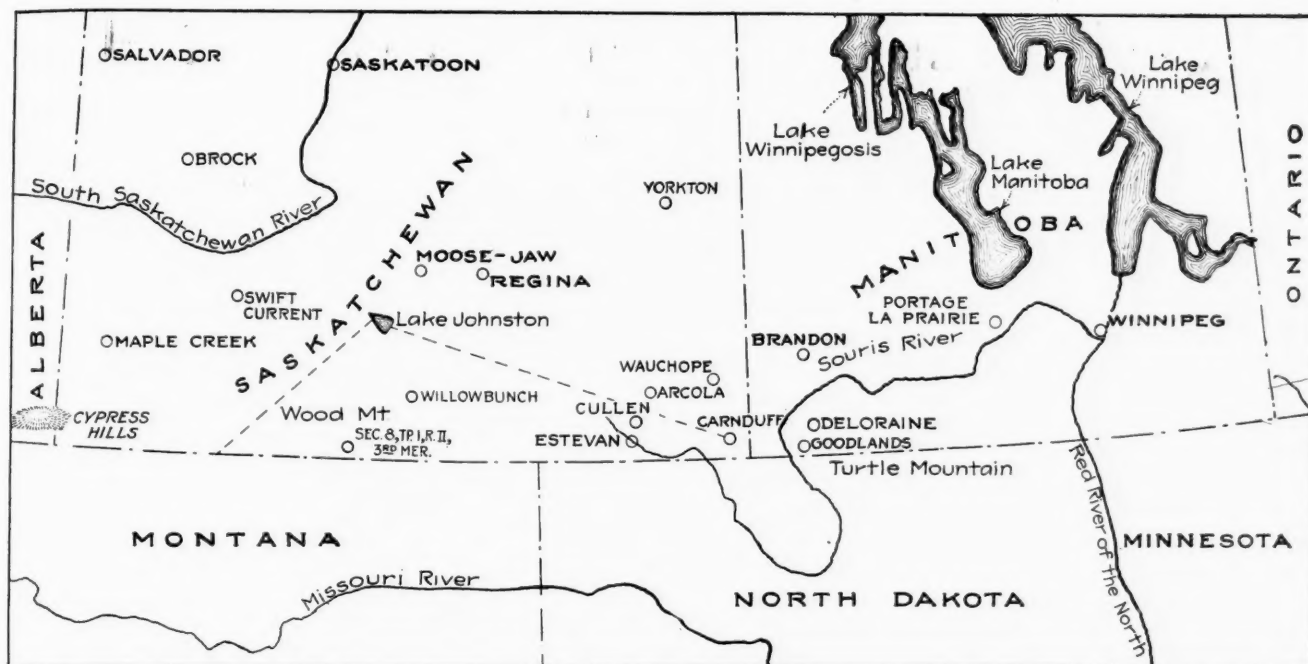
Both groups are subdivided into actual and probable reserves. Actual reserves include coal the amount of which can be calculated with some degree of accuracy, being "based on a knowledge of the actual thickness and extent of the seams." Probable reserves include coal of which "an approximate estimate only" can be made.

At the present time, to be economically "workable"



DISTRIBUTION OF COAL IN WESTERN CANADA

The areas shown as containing anthracite and bituminous coal include also, in places, sub-bituminous coal and lignite; similarly some of the sub-bituminous areas also contain lignite.



SOUTHERN SASKATCHEWAN AND MANITOBA, SHOWING POINTS MENTIONED IN ARTICLE

a seam must be more than one foot thick, and there is no coal mine in Canada that has a depth approaching 4000 ft., though, in the Crowsnest district, some workings have a "cover" several thousand feet thick. At great depth the greatly increased ventilation required is a matter of expense and difficulty; "creep" and subsidences of strata are unavoidable, and they either crush the coal or render it inaccessible. The capital required for the development of the mine and the current expenditure that its operation demands increases out of all proportion with depth, while the cost of raising water, coal, miners, etc., also advances.

Dr. Dowling's estimate of the coal reserves in Group I is as follows:

TABLE I. ACTUAL COAL RESERVES OF WESTERN CANADA IN MILLIONS OF METRIC TONS¹

(Calculation based on actual thickness and extent)

	Lignite	Lignite or Sub-bituminous	Low Carbon Bituminous	Bituminous and High-Carbon Bituminous	Semi-Anthracite	Total
Saskatchewan.....	2,412					2,412
Alberta.....		382,500	1,197	2,027	669	386,373 ²
British Columbia.....		60	118	23,653 ²		23,831
Total.....	2,412	382,560	1,315	25,680	669	412,616 ²

PROBABLE COAL RESERVES OF WESTERN CANADA IN MILLIONS OF METRIC TONS

(Approximate estimate)

	Lignite	Lignite or Sub-bituminous	Low Carbon Bituminous	Bituminous and High-Carbon Bituminous	Semi-Anthracite	Total
Manitoba.....	160					160
Saskatchewan.....	57,400					57,400
Alberta.....	26,450	464,821	139,161	43,022 ²	100	673,554
British Columbia.....		5,136	2,300	42,608 ⁴		50,044
Total.....	84,010	469,957	141,461	85,630	100	781,158

¹ Metric ton is equivalent to 2,204.62 lb., practically a long ton. No conversion has been attempted because the figures are not, of course, so absolutely accurate that this course is advisable.

² Includes semi-anthracite.

³ Total after deducting 20 million tons mined in 1911.

⁴ Includes 1,800 million tons of cannel.

TOTAL COAL IN WESTERN CANADA (GROUP I)

	Tons	Per Cent.
Manitoba.....	160,000,000	0.1
Saskatchewan.....	59,812,000,000	6.1
Alberta.....	1,059,927,400,000	88.8
British Columbia.....	73,874,942,000	5.0
Total.....	1,193,774,342,000	

The classification of coals adopted in this paper is that used in the "Coal Resources of the World," as below:

Anthracite—Fuel ratio,² 12 or over; Calorific value, 14,500 to 15,000 B.t.u.; Carbon, 93 to 95 per cent.; Volatile combustible matter, 3 to 5 per cent.

Semi-anthracite—Fuel ratio, 7 to 12; Calorific value, 15,000 to 15,500 B.t.u.; Carbon, 90 to 93 per cent.; Volatile combustible matter, 7 to 12 per cent.

Anthracite and High-carbon Bituminous—Fuel, ratio, 4 to 7; Calorific value, 15,200 to 16,000 B.t.u.; Carbon, 80 to 90 per cent.; Volatile combustible matter, 12 to 15 per cent.; does not readily coke.

Bituminous—Fuel ratio, 1.2 to 7; Calorific value, 14,000 to 16,000 B.t.u.; Carbon, 75 to 90 per cent.; Volatile combustible matter, 12 to 26 per cent.; generally cokes.

Low-carbon Bituminous—Moisture content occasionally reaches 6 per cent.; Volatile matter, up to 35 per

cent.; $\frac{\text{Fixed carbon} + \frac{1}{2} \text{volatile}}{\text{Hygroscopic moisture} + \frac{1}{2} \text{volatile}} = 2.5 \text{ to } 3.3$; Calorific value, 12,000 to 14,000 B.t.u.; Carbon, 70 to 80 per cent.; makes porous, tender coke.

Cannel—Yields 30 to 40 per cent. volatile matter on distillation; Calorific value, 12,000 to 16,000 B.t.u.; very porous coke.

Lignite or Sub-bituminous—Generally contains over 6 per cent. of moisture; Moisture, freshly mined, up to

20 per cent.; $\frac{\text{Fixed carbon} + \frac{1}{2} \text{volatile}}{\text{Hygroscopic moisture} + \frac{1}{2} \text{volatile}} = 1.8 \text{ to } 2.5$; Calorific value, 10,000 to 13,000 B.t.u.; Carbon, 60 to 75 per cent.

²The fuel ratio is obtained by dividing the percentage of fixed carbon by the percentage of volatile matter.

Lignite—Moisture in commercial output, over 20 per cent.; Calorific value, 7000 to 11,000 B.t.u.; Carbon, 45 to 65 per cent.

MANITOBA

In Manitoba, the Turtle Mountain coal field occupies an area of about 48 square miles. About 1890, an attempt to mine coal was made near Goodlands, but it was unsuccessful, probably because the seams were thin and of poor quality. Coal has also been mined near Deloraine, but only for local use. The insignificance

may thus be represented in an adjoining locality by a series of thin seams separated by sheets of sand or clay."

SASKATCHEWAN

In Saskatchewan, two coal-bearing formations are exposed, namely, (1) the Belly formation of the Cretaceous and (2) Tertiary, which is much more important than the Cretaceous, and underlies the Estevan District, Wood Mountain and the Missouri Coteau.³ The two principal fields are roughly triangular

TABLE II. ANALYSES OF SASKATCHEWAN COALS

District	Moisture Condition*	Loss in Air Drying	Moisture	Volatile Combustible	Fixed Carbon	Ash	B.t.u. per Lb., Gross	Fuel Ratio	Carbon Hydrogen Ratio	Coking Properties	Name of Mine	Authority for Analyses †
Lignite:												
Estevan area...	A.D.	18.4	18.2	32.7	35.4	13.7	7,890	1.10	8.5	Non-coking	Estevan Coal and Brick Co.	Mines Br., B. 24
Estevan area...	A.D.	14.7	18.0	40.2	35.2	6.6	8,770	0.88	8.2	Non-coking	West Dom. Collieries	Mines Br., B. 24
Estevan area...	A.D.	14.0	23.6	31.4	38.6	6.4	.....	1.25	.....	Non-coking	Bienfait mine	Mines Br., B. 24
Willowbunch area.....	R.	.....	8.5	39.5	35.4	16.6	.....	0.90	.....	Non-coking	Waldon mine	Mines Br., B. 24
Wood Mt. area.	R.	.....	13.8	38.3	37.3	10.6	.....	0.97	.....	Non-coking	Sec. 8, Tp. 1, R. II W. of 3rd Mer.	Mines Br., B. 24

TABLE III. ANALYSES OF ALBERTA COALS

Anthracite:												
Banff, commercial.	A.D.	0.5	0.5	11.7	75.7	12.1	13,250	6.45	22.0	Non-coking	Bankhead colliery	Mines Br., B. 25
Banff, briquets†	A.D.	1.8	0.9	17.0	68.0	14.1	12,970	4.00	20.2	Non-coking	Bankhead colliery	Mines Br., B. 25
Bituminous:												
Crownsnest Pass.	A.D.	1.3	0.7	24.9	54.7	19.7	11,640	2.20	16.7	.....	Denison colliery	Mines Br., B. 25
Crownsnest Pass.	A.D.	0.7	0.2	27.6	56.8	15.4	12,370	2.05	16.4	.....	Bellevue Colliery	Mines Br., B. 25
Crownsnest Pass.	A.D.	0.0	1.2	26.0	56.3	16.5	12,330	2.15	14.9	Good coke	Franco-Can. Col.	Mines Br., B. 25
Canmore.....	A.D.	0.0	0.9	14.0	79.7	5.4	14,470	5.70	20.5	Very slight	No. 2 mine, Canmore	Mines Br., B. 25
Brazeau.....	A.D.	1.0	0.9	16.5	70.6	12.0	13,480	4.30	18.7	Poor coke	Brazeau collieries	Mines Br., B. 25
Jasper Park.....	A.D.	1.8	0.5	18.8	58.9	21.8	11,790	3.10	17.6	Good coke	Jasper Park collieries	Mines Br., B. 25
Yellowhead Pass	A.D.	1.8	7.5	30.3	54.6	7.6	11,480	1.80	12.9	Non-coking	Pacific Pass colliery	Mines Br., B. 25
Mountain Park.	A.D.	1.4	1.9	30.9	62.9	4.3	14,400	2.05	15.5	Good coke	Mountain Park mine	Mines Br., B. 25
Lignite:												
Pincher Creek...	A.D.	1.2	3.8	28.9	38.7	28.6	9,440	1.35	12.1	.....	Breckenridge & Lund Coal Co.	Mines Br., B. 25
Lethbridge.....	A.D.	0.5	7.9	34.5	47.5	10.1	10,790	1.35	11.3	Non-coking	Galt No. 3 mine	Mines Br., B. 25
Magrath.....	A.D.	0.0	9.6	32.8	47.8	9.8	10,640	1.45	11.9	Non-coking	Chinook Coal Co.	Mines Br., B. 25
Milk River.....	.....	.....	5.6	37.8	49.8	6.8	.....	2.81	.....	Non-coking	Sec. 2, Tp. 4, R. XIX, W. 4	Geol. Surv., M. 53
Taber.....	A.D.	1.5	11.7	31.8	44.1	12.4	9,750	1.40	10.4	Non-coking	Canada West Co.	Mines Br., B. 25
Bow Island.....	.....	.....	17.3	30.9	46.3	5.6	9,259	.....	.....	Non-coking	.....	Pearce,
Medicine Hat...	.....	.....	19.9	33.3	41.6	5.2	.....	1.59	.....	.....	Stair mine	Geol. Surv., M. 53
Aldersyde.....	A.D.	2.9	10.2	32.7	50.1	7.0	10,660	1.55	11.7	Non-coking	Ellis Bros. No. 1 mine	Mines Br., B. 25
High River.....	.....	.....	2.2	34.6	56.4	6.8	.....	3.78	.....	.....	Sec. 26, Tp. 19, R. IV, W. 5th	Geol. Surv., M. 53
Drumheller.....	A.D.	7.2	8.8	34.6	48.4	8.2	10,350	1.40	11.9	Non-coking	Rosedale mine	Mines Br., B. 25
Big Valley.....	.....	.....	12.1	30.0	44.3	8.6	.....	.....	.....	.....	Pearce,	
Brooks.....	.....	.....	11.1	38.7	40.9	9.2	.....	1.97	.....	.....	Bow river, Horse-shoe bend	Geol. Surv. M. 53
Hanna.....	A.D.	4.2	20.8	31.0	42.4	5.8	9,120	1.35	9.4	Non-coking	Wadsworth mine, Hanna	Mines Br., B. 25
Lacombe.....	A.D.	7.0	22.7	30.7	38.4	8.2	8,220	1.25	8.6	Non-coking	McCormack mine, Castor	Mines Br., B. 25
Trochu.....	A.D.	2.4	15.3	27.9	48.2	8.6	9,810	1.75	11.2	Non-coking	Halbert mine	Mines Br., B. 25
Three Hills.....	A.D.	0.9	14.3	28.5	48.8	8.4	9,890	1.70	11.0	Non-coking	Wilson mine	Mines Br., B. 25
Carbon.....	.....	.....	9.9	34.9	46.6	8.7	.....	2.35	.....	.....	Knee Hills creek, R. XXIII	Geol. Surv., M. 53
Battle River....	A.D.	3.1	23.0	28.7	42.3	6.0	8,770	1.45	8.9	Non-coking	Bish mine	Mines Br., B. 25
Camrose.....	.....	.....	18.3	31.8	44.7	5.1	9,250	.....	.....	.....	Pearce,	
Tofield.....	A.D.	8.7	15.9	34.3	44.2	5.6	9,800	1.30	10.1	Non-coking	Tofield Coal Co.	Mines Br., B. 25
Clover Bar.....	A.D.	9.6	17.6	27.8	46.6	8.0	9,130	1.65	10.2	Non-coking	Clover Bar Coal Co.	Mines Br., B. 25
Edmonton.....	A.D.	5.8	18.2	33.6	38.9	9.3	8,780	1.15	9.0	Non-coking	Strathcona Coal Co.	Mines Br., B. 25
Namao.....	A.D.	4.6	22.1	29.7	43.1	5.1	9,050	1.45	9.2	Non-coking	Comfort Coal Co.	Mines Br., B. 25
Cardiff.....	A.D.	9.6	18.2	31.9	44.6	5.3	9,360	1.40	10.0	Non-coking	Cardiff collieries	Mines Br., B. 25
Wabamun.....	A.D.	2.5	16.8	32.4	45.1	5.7	9,150	1.40	10.8	Non-coking	Security mine, Wabamun	Mines Br., B. 25
Pembina.....	A.D.	6.2	11.5	31.5	46.6	10.4	9,580	1.50	10.8	Non-coking	Pembina mine	Mines Br., B. 25
Peace River....	A.D.	1.6	10.4	32.0	53.8	3.8	11,830	1.70	12.2	Non-coking	Brown's pit, 21-70-10, W. 6	Mines Br., B. 25
	R.	.....	1.1	23.0	70.6	5.3	.....	3.05	.....	Good coke	Abbott claim, 4-57-7 W. 6	Mines Br., B. 25

* Figures in this column indicate moisture condition. "A.D." indicates that sample analyzed was air-dried; "R" indicates fuel as received.

† "Mines Br., B. 24" or "Mines Br., B. 25" indicates that the analysis was extracted from Bulletin 24, or 25, Mines Branch, Federal Department of Mines. "Geol. Surv. M. 53" indicates that it was obtained from Memoir 53, by D. B. Dowling, Geological Survey of Canada. "Pearce" indicates that the data were obtained from a blue print compiled by William Pearce, Calgary, and are "from various sources believed by the compiler to be reliable."

‡ Coal dust briquetted with about 10 per cent. coal tar.

of the production is indicated by the fact that the "Annual Report on the Mineral Production of Canada," published by the Mines Branch, Ottawa, gives no statistics of coal production in Manitoba. The "probable," not "actual," reserves are estimated at 160,000,000 tons of lignite.

Dr. D. B. Dowling states that "the coal horizon does not appear to consist of a series of seams in continuous sheets, but rather of deposits which are limited in extent though repeated over large areas. A thick seam

in shape. The latter is bounded on the northeast by a line extending from the vicinity of Carnduff to Johnston lake, on the west by a line thence to the international boundary west of Wood Mountain and on the south by the international boundary. The other field extends from the boundary between Saskatchewan and Alberta to the vicinity of Swift Current and includes the eastern portion of the Cypress Hills.

³Coteau, a hilly upland adjacent to a river or between two rivers.—Editor.

The Souris Valley is about 120 ft. deep near Estevan and presents peculiarly advantageous conditions for prospecting and for mining the seams that outcrop in its banks and in the tributary gullies and ravines. Though there can be little doubt that enormous areas in Saskatchewan are underlaid by coal seams, the heavy covering of boulder clay conceals their outcrops and, except in occasional rock exposures in the hillsides and stream valleys, their existence can only be determined by boring. At the Estevan mines, most of the coal is produced from the lower measures, the thickness of the mineral at this point being 8 ft. In the western portion of the district, the bed splits up into several small seams; but it is reported that to the north-east it increases to 15 feet.

Lignite has also been reported near Cullen, 16 ft.; Arcola, 14 ft.; Wauchope, 8 ft.; and in a number of localities, particularly in the Wood Mountain and Cypress Hills districts. Coal has been found in borings or natural exposures of rocks of the Belly River formation in the western portion of Saskatchewan, notably at Maple Creek, Brock and Salvador. It carries from 27 to 34 per cent. fixed carbon. Coal carrying 35 per cent. fixed carbon has also been found in the Dakota sandstone (Cretaceous) near lac la Ronge.

It is estimated that, in Saskatchewan, an area of 13,100 square miles is underlaid by coal seams. The "actual" and "probable" reserves of coal aggregate 59,812 million tons, all lignite. The annual production of coal in Saskatchewan during the period 1898-1917 is shown in Table IV.

The output of the mines in the Souris field constitutes 95½ per cent. of the production of the province. The mines at Gladmar and Hart produce about 1½ per cent., the remainder of the output coming from mines that produce less than 1000 tons each per annum.

ALBERTA

As indicated in Table I the "actual" and "probable" reserves of coal in Alberta are estimated as aggregating 1,059,927 million tons, and constitute 87 per cent. of the coal in Canada. The coal horizons in Alberta are: (1) Edmonton formation, with which may be associated the Paskapoo beds. (2) Belly River formation. (3) Kootenay formation. Coal is found in the Tertiary rocks, but most of the seams are too thin to mine.

Of the total area, 24,779 square miles, occupied by the Edmonton and Paskapoo beds, 22,475 square miles is assumed to be underlaid by coal. The "actual" and "probable" reserves in these beds aggregate 789,600 million tons of lignitic or sub-bituminous coal and 11,358 million tons of low-carbon bituminous. Of the reserves in the Edmonton formation, 98.6 per cent. is lignite or sub-bituminous and 1.4 per cent. is low-carbon bituminous.

TABLE IV. ANNUAL COAL PRODUCTION IN SASKATCHEWAN, 1898-1917

	Tons	Value		Tons	Value
1898.....	25,000	\$37,500	1908.....	150,556	\$253,790
1899.....	25,000	37,500	1909.....	192,125	296,339
1900.....	40,500	60,750	1910.....	181,156	293,923
1901.....	45,000	72,000	1911.....	206,779	347,248
1902.....	70,400	112,640	1912.....	225,342	368,135
1903.....	116,703	169,618	1913.....	212,897	358,192
1904.....	124,885	187,021	1914.....	232,299	374,245
1905.....	107,596	152,334	1915.....	240,107	365,246
1906.....	108,398	164,146	1916.....	281,300	441,836
1907.....	151,232	252,437	1917.....	355,445	662,451

TABLE V. COAL PRODUCTION OF ALBERTA IN THE PERIOD 1898-1917*

	Tons	Value		Tons	Value
1898.....	315,088	\$787,720	1908.....	1,685,661	\$4,127,311
1899.....	309,600	774,000	1909.....	1,994,741	4,838,109
1900.....	311,450	778,625	1910.....	2,894,469	7,065,736
1901.....	340,275	850,687	1911.....	1,511,036	3,979,264
1902.....	402,819	960,601	1912.....	3,240,577	8,113,525
1903.....	495,893	1,117,541	1913.....	4,014,755	10,418,941
1904.....	661,732	1,404,524	1914.....	3,683,015	9,350,392
1905.....	931,917	1,993,915	1915.....	3,360,818	8,283,079
1906.....	1,246,360	2,614,762	1916.....	4,559,054	11,386,577
1907.....	1,591,579	3,836,286	1917.....	4,736,368	14,155,685

* "The Production of Coal and Coke in Canada, During the Calendar Year 1916," p. 29. By John McLeish, Mines Branch, Department of Mines, Ottawa.

The Edmonton formation forms a wide trough lying approximately parallel to the Rockies and extending from the international boundary to about latitude 55° 30'. The central portion of the trough is occupied by Tertiary sandstones.

The "Big" coal seam, which is 25 ft. thick where



ALBERTA, WITH LEADING COAL CENTERS

it outcrops on the North Saskatchewan, consists of two 10-ft. seams near the Grand Trunk Pacific crossing of the Pembina River. It is 10 ft. thick on the Red Deer River near Alix, but decreases to about 5 ft. south of the Bow River.

Another persistent coal horizon is found 500 to 600 ft. below the "Big" seam. At Calgary, where it has been found in a borehole 1800 ft. below the surface, it is 13 ft. thick; near Drumheller it is 6 ft. 10 in. thick; on Battle River it has a thickness of 4 ft. At Edmonton, there are two seams of good domestic coal, each about 6 ft. thick.

The Belly River formation occupies a considerable area in the southeastern portion of the province. The most important seams in this formation are exposed at Lethbridge. At this point, the main seam is 5 ft.

6 in. thick. The probable reserves in the Belly River are: Lignite, 29 per cent.; lignitic or sub-bituminous, 10.5 per cent.; low-carbon bituminous, 60.5 per cent.

The discovery of a 4-ft. and a 7-ft. seam at Maple Creek, at depths of 197 and 292 ft. respectively, indicates that this formation contains workable seams as far east as southern Saskatchewan.

What is assumed to be the "upper" seam has been found at Tofield, at a depth of 1050 ft., and at Edmonton, at a depth of 1400 ft., where it is 6 ft. thick. At Calgary, a 5-ft. seam found at 2562 ft., a 7-ft. seam at 2656 ft. and a 4-ft. seam at 2875 ft. are believed to be in the Belly River formation.

The Kootenay formation is exposed in and near the Rocky Mountains. As a result of the great uplift of

TABLE VI. PRODUCTION OF COAL IN ALBERTA, 1917, BY DISTRICTS

District	Production, Short Tons	Per Cent. of Total
Anthracite:		
Banff.....	108,225	2.3
Bituminous:		
Crowsnest Pass.....	1,188,456	25.1
Canmore.....	196,947	4.2
Brazeau.....	266,823	5.6
Jasper Park.....	248,733	5.2
Yellowhead Pass.....	159,182	3.4
Mountain Park.....	139,164	2.9
Total bituminous.....	2,199,305	46.4
Lignite:		
Pincher Creek.....	4,652	0.1
Lethbridge.....	614,017	13.0
Magrath.....	936	..
Milk River.....	8,047	0.2
Taber.....	157,373	3.3
Bow Island.....	6,043	0.1
Medicine Hat.....	13,975	0.3
Aldersyde.....	7,076	0.2
High River.....	1,126	..
Drumheller.....	631,767	13.3
Big Valley.....	26,753	0.6
Brooks.....	9,233	0.2
Hanna.....	25,670	0.5
Lacombe.....	16,097	0.3
Trochu.....	15,023	0.3
Three Hills.....	22,457	0.5
Carbon.....	4,301	0.1
Battle River.....	9,862	0.2
Camrose.....	56,625	1.2
Tofield.....	68,806	1.5
Clover Bar.....	256,208	5.4
Edmonton.....	121,080	2.6
Namoo.....	18,195	0.4
Cardiff.....	237,861	5.0
Wabamun.....	13,534	0.3
Pembina.....	81,911	1.7
Peace River.....	210	..
Total lignite.....	2,428,838	51.3
Total production.....	4,736,368	.....

the Rockies, the upper measures were denuded and only remnants of the lowest division of the Cretaceous—the Kootenay—survived. These remnants are usually found occupying valleys between the mountain ranges, the mountains having served as a protecting agency. At the same time, the crumpling and folding of the strata during the uplift of the mountains have given us a coal that, in places, is semi-anthracite or is anthracitic. It is estimated that, of the "actual" and "probable" reserves, 1.7 per cent. is semi-anthracite and 98.3 per cent. is high-carbon bituminous or bituminous. The coal in the Kootenay formation is the highest grade found in the Prairie Provinces.

In Alberta, the three principal seams in the Coleman area have a thickness of 16 ft., 10 ft., and 8 ft. respectively. In the Blairmore area there are seams 10, 17, 3½, 3½, 17 and 6 ft. thick respectively. A seam 20 ft. thick has been reported in the Moose Mountain area. In the Banff area, the coal varies from anthracite to bituminous. In the southeastern portion of the field there is a total thickness of coal of from 41 to 86 ft.

At Bankhead, the workings have cut seams 3 ft., 7 ft. (in thin bands), 8 ft., 19 ft. (in two benches), 13 ft. (in three benches) and 6 ft. thick respectively.

In the Bighorn basin, seams aggregating about 60 ft. of workable coal have been found. Seams of 21 ft., 7½ ft. and 4½ ft. are being mined at Mountain Park. Coal is also found in the Kootenay formation at numerous other points in the Rockies and in the foothills. On the Muskeg River, seams 11½ ft., 25 ft. and 7 ft. thick respectively, have been found.

The Chief Inspector of Coal Mines for Alberta states that in 1916 the total sales in Canada of coal produced in Alberta were 4,227,164 tons; that 2,956,205 tons were sold for consumption in Alberta, 1,021,656 tons in Saskatchewan, 98,629 tons in Manitoba, 89,582 tons in British Columbia and 61,092 in the United States.

The total coal production of Alberta, in 1917, was 4,736,368 tons. Of this production, 2,428,838 tons, or 51.3 per cent., was lignite; 2,199,305 tons, or 46.4 per cent., was bituminous; 108,225 tons, or 2.3 per cent., was semi-anthracite.

(To be concluded)

Coal and Oil in Rhode Island

BY KIRBY THOMAS

New York City

A full-fledged oil drilling rig, installed on Conanicutt Island, Narragansett Bay, Rhode Island, is a sight that might well surprise the oil expert and the engineer, yet the fact exists and the conditions of its being are interesting. The American Oil Co., of Boston, successor to several companies formed in recent years to fathom the geological mysteries of the smallest state in the union, erected in 1918 a rig on the eastern shore of the island and drilled to a depth of 2000 ft. for oil. In the previous year, a subsidiary interest, using a Star rig, drilled to 1300 ft., in the same locality.

In both cases the results were negative as to oil, although some interesting data as to the extent and character of the graphitic shale of the area were brought to light. The geological formation drilled is a southerly extension of the coal-bearing horizon in which to the north, at Portsmouth, several years ago the Whitney interests of Boston undertook an ambitious, but ill-fated, operation in coal.

On Conanicutt Island the graphitic shales appear to correspond to the coal measures at Portsmouth; and the drilling, while disclosing no coal measures, confirmed this relation in a general way. The drills were sunk to the underlying basal sandstone and probably through the geological measures which correspond to those in which the Portsmouth coal is found. The strata on the island dip to the west about 45 deg. and appear to be duplicated by a fold or fault between the east and west shores.

This local structure furnished the assumption for a syncline on which the oil experts based their hopes. The strata were all found to be highly metamorphosed.

This oil exploration has had the result of settling the question of whether or not the Portsmouth coal measures would be found in that direction. It is only a few years ago that a company was formed to develop coal on the island on this same property. The American Oil Co. is now planning to develop and operate the graphite deposits and has apparently given up expectations of finding oil.

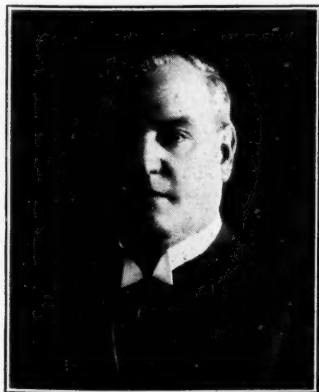
The New Pittsburgh Station of the Bureau of Mines—II

BY GEORGE W. HARRIS
Editorial Staff, "Coal Age"

OPPORTUNITY for research is offered to an unusual degree in all phases of mining and allied fields in this comparatively new bureau, which has attracted many enthusiastic experts and specialists. Their services are directed largely to the working out of special technical problems. While the war lasted the work of the Pittsburgh station was entirely devoted to the demands that were made upon it for assistance on problems connected with war work, but plans are now completed for a return to a peace basis. The organization is being strengthened by a larger personnel, including many of those formerly connected with the Pittsburgh station.

In reviewing the work of the Bureau of Mines during the past two years especial attention should be called to Director Van H. Manning, who on account of rare vision was quite prepared to assist in war work. He saw that sooner or later we would get into the war, and also how it would be possible to merge into war activities—especially gas work. When the time came, the Bureau simply took it up without asking for the assistance of anyone. The slogan was—Is this going to help win the war? If that test could not be met satisfactorily, then the force was put on something that would be of assistance in winning.

G. A. Burrell was placed in charge of war gas investigation; until the war broke out he had charge of gas investigations in the Bureau's laboratory, and was a leading expert in gas work. Various men of the Bureau assisted Mr. Burrell, among whom were A. C. Fieldner, supervising chemist, on testing absorbents for gas masks and the masks themselves; J. W. Paul, chief coal mining engineer (in the early part of the work), on design and tests of gas masks and training of army officers in the use of masks; D. J. Parker, mine safety engineer, in charge of mine rescue work; W. E. Gibbs, the inventor of the Gibbs rescue apparatus, on mechanical design; H. H. Clark, electrical engineer, with his assistants, devoted his time to gas masks and other appliances used in warfare. On the physiological side, Yandell Henderson, a consulting physiologist of the Bureau and the Yale School of Medicine, was called in

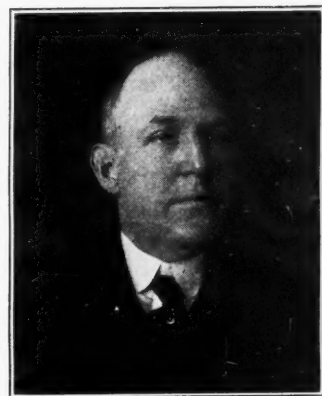


VAN H. MANNING
Director of Bureau of Mines

to organize in his specialty; he was associated with D. J. Parker on matters pertaining to breathing apparatus.

All the chemical work in connection with the designing and making of the first lot of gas masks, in the early part of the war, was done in Pittsburgh, as was also the testing. The whole problem grew so that the undertaking had to be established in a separate station. Accordingly the American University

site in Washington was used, and new buildings were put up in which to carry on the work. The Bureau force was moved down there in September, 1917, and was added to from other sources; when taken over by the War Department in July, 1918, some 1500 men were included and incorporated in the Research Division of Chemical Warfare Service. On the facing page is shown the latest type United States Army Tis-



D. A. LYON
Supervisor of Stations

sot mask, which is pronounced superior to the mouth-piece type largely used in the war and copied from the English model. The United States Army mask is more comfortable to wear, has a larger angle of vision and men are able to fight better with it on than with that of any other make.

Considerable prominence might to advantage be given to the gas mask illustrated, as it is one of the types which will be used in the industries. Furthermore, the Bureau of Mines not only took an active part in its development but expects to follow up the matter in connection with its future usefulness. Therefore a brief description of the mask would be fitting. It consists essentially of a facepiece of rubber backed up with fabric; it carries two eyepieces and a connection for a flexible rubber tubing to a canister of absorbents. The canister is supported in a knapsack slung from the neck. This canister contains a mixture of 60 per cent. charcoal and 40 per cent. soda lime, by volume; there is an inlet valve in the bottom and an exhalation valve on a small metal casting attached to the facepiece. The wearer of this mask breathes through the canister, which filters out poison gases and gives him pure air. This mask is limited as to efficiency to 1 per cent. and less of concentrations of gases; in the case of higher percentages, some of the gases pass through the absorbents. Also, the standard filling in the canister being an alkali is intended to neutralize the acid which is the base of many of the poison gases used in the war. This mask will not replace the rescue breathing apparatus used in mines, around blast furnaces, gas producers or illuminating gas plants. It should not be used in places where oxygen is scarce.

A. C. Fieldner, the authority for the gas mask information, also states that the Bureau of Mines is interested in the problem of a suitable absorbent for carbon monoxide and expects, in the not far distant future, that a suitable canister filling for carbon monoxide will become available. It has its legitimate field, but great caution is necessary in its use. In general no mask should be used in gas unless an expert has first looked into the matter. The Bureau of Mines

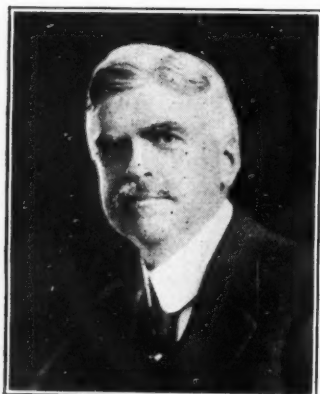
expects to advise in such cases when requested and will approve any mask submitted by manufacturers which will do the work claimed for it. This is similar to the investigations and tests which are now conducted in the case of explosives, lamps and motors. Permissible masks should meet with popular approval.

The explosives laboratory at the Pittsburgh station did a great deal of research work on new military explosives—also on the substitution of other materials which could be used in the manufacture of industrial explosives to satisfy heavy demands. Of course, much of this work done on military explosives will apply to mining; and this same principle will hold true as regards gas mask work also.

The public does not tire of hearing about the war history of our institutions and industrial plants. This should be especially true in regard to the activities of the Bureau of Mines during this trying period. Among the stations of the Bureau the one at Urbana, Ill., was chiefly occupied in the problem of recovery of sulphur from coal brasses (iron pyrites) for use in the manufacture of sulphuric acid. Coal operators would certainly welcome a permanent and satisfactory solution of the problem of the utilization of sulphur found in coal beds. Also here was solved the problem of the utilization of the coals of the middle west for gas manufacture; formerly it was considered that eastern coals were essential for this purpose.

In the State of Washington, fuel oils were shut off as the war absorbed this product, and accordingly a study was made of this situation to show how to utilize the coals of that immediate section to take the place of oil fuel.

It is of interest to know just how each of these stations functions and fits in with the general plan of the Bureau of Mines—each attempts to serve the district in which it is located. The Pittsburgh station is the most important one of the Bureau by reason of its size and the appropriation made for it. By reason of its facilities and staff it can serve the other stations in various ways, such as reference, computing, photographic and analytical work; the smaller stations can undertake much of this work only in a limited way on account of their smaller appropriations. Furthermore, there is a limited demand for such work at any one of the other stations. An endeavor is made to coördinate the work of all so as to prevent any useless duplication and to insure the use of plant and equip-



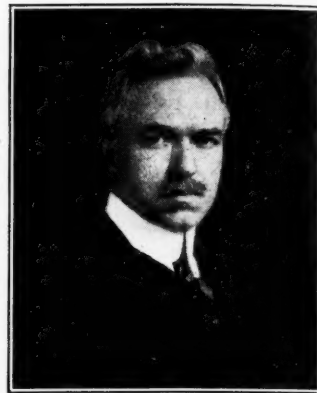
GEORGE S. RICE
Chief Mining Engineer of the
Bureau

ment to the fullest extent. In commenting on the field of labor of the Bureau of Mines, emphasis has been placed more or less on the research work of this institution. However, D. A. Lyon, the supervisor of stations, states that the Bureau of Mines is not merely a big research body—that it does the work within its scope. This action is definitely established by an act of Congress—either the prevention of loss of life or the saving of waste. In discussing this point with Mr. Lyon, he stated that if there is any doubt as to the propriety of going ahead in any matter, it is generally easy, if the broad act establishing the Bureau is considered, to determine whether or not a given problem falls within the scope of the work as planned when the Bureau was authorized.

As the Bureau developed it was evident that a field station should be planned so as to be able to cooperate with the commercial establishments and institutions around it. Thus at the Pittsburgh station the idea would be to build up research in coal mining in all its ramifications; those matters naturally claiming attention here would be safety or accident prevention, mining methods, the minimizing of waste, permissible explosives and ventilation problems, among others. But possibly the biggest problem of all is the utilization of coal. Naturally the mining companies encourage the buying of coal—it is the consumer who has in mind its saving; the whole nation is interested in saving fuel and

in its most efficient utilization in every industry. But after all the major premise is the life and health of the miner and the prevention of the waste of resources. The Pittsburgh station is a big institution devoting much of its energy to matters connected with coal and coal mining. It is right and proper that it should do so, as 50 per cent. of our investments are in connection with fuel. The next single item as to investment is iron, representing 24 per cent.; all other metals are a little more than 25 per cent. The Bureau has tried to proportion the work of the stations to the money invested and to meet the needs of all the industries. In a coal sense many of the fuel problems of Pittsburgh are those of the coal fields of the whole country.

Environment has great weight. Dr. Holmes' original idea was to have one big station in the East and another in the West, and other stations distributed over the country, as an act of Congress provides. It is most desirable to have a Bureau station rub elbows with an industry in each particular instance. In the event



O. P. HOOD
Chief Mechanical Engineer of
the Bureau



HOW TISSOT MASK IS ADJUSTED

of a laboratory far removed from a practice to be investigated, it would be one thing to read about it and quite another matter to sense the problem by actual contact with the industry. It might be said here that it is not only to save fuel that the Bureau attacks the problems of an industry, but also to discover means of cheapening a process as well.

Professional ethics are strictly observed by the Bureau in its relations with consulting engineers and chemists. This matter is one it has to contend with, and the Bureau observes the rule of not encroaching on the field of the engineer in private practice in a competitive sense. This idea is kept uppermost even if it results in no action being taken toward the solution of problems which distinctly fall within the scope of the Bureau's work. Also if the problem is of a purely limited and local nature, possibly concerning a single individual, then this party is advised to have the matter attended to by his own engineer. But if a problem is one that has not been solved, and it is of a sufficiently broad scope, then the Bureau is glad to undertake its solution.

The new Pittsburgh station of the Bureau of Mines was to be essentially a laboratory for the investigation of coal and iron problems and the practical application of its findings to these industries. Nevertheless, it also was to be in the nature of a clearing house for the other stations throughout the country. It seems to be developing along these broad lines.

(To be continued)

Coal and Coke Operations of the United States Steel Corporation

The United States Steel Corporation mined 25,393,155 tons of coal for use in the manufacture of coke, and 6,354,980 tons for steam, gas and all other purposes in 1918, a total of 31,748,135 tons of coal. The annual report for this company for the fiscal year ended Dec. 31, 1918 was made public on Mar. 31. This report also shows that during last year 9,962,403 tons of coke were manufactured in beehive ovens and 7,795,233 tons in the byproduct type, a total of 17,757,636 tons as compared with 17,461,675 tons the previous year.

The total amount expended by the corporation and its subsidiary companies during the year 1918 for safety work was \$1,110,064; \$998,800 was spent in a similar way in 1917. Compared with results in 1917, the fatal and other serious accidents per 1000 employees showed a decrease of 7.64 per cent.; compared with 1906 there was a decrease of 46.1 per cent. The total amount disbursed by all the corporation companies during 1918 in connection with work accidents was \$3,336,459. Of this sum 87 per cent. was paid directly to the injured employees or their families, or in taking care of them. These payments were made either under the corporation's voluntary accident relief plan or under the provisions of the Workmen's Compensation Laws of the several states in which the subsidiary companies are operating.

During 1918 the Steel Corporation acquired the following territory: In Pennsylvania, 117 acres of coking coal and 37 acres of surface were purchased in the Connellsville district; in the Pittsburgh district (Greene County), 14,207 acres of steam coal were bought; in Vermillion county, Illinois, 584 acres of coal land were acquired; 200 acres of coal and 104 acres of surface

were purchased in the Black Mountain district of Kentucky. Additional mining and shipping equipment was provided for the Palmer, Dilworth, Maxwell, Gates, Leckrone, Ralph and Ronco mines in the Connellsville district. In the Pocahontas field, West Virginia, 130 tenements were completed, also 169 other houses and a clubhouse; street and sanitary improvements were made at various works.

The number of employees on the coal and coke properties of the corporation during 1918 was 28,378, as compared with 26,189 in 1917. The average salary or wage per employee per day, including general administrative and selling force, was \$5.38 in 1918; it was \$4.16 in 1917. Employees, to the number of 34,407, or about one-eighth of the total average number of employees in all departments of the corporation, entered the active military and naval service of the United States during the war.

In what is known as the northern coal and coke property, the corporation has 219,205 acres of coking coal, 115,362 acres of steam coal and 80,059 acres of surface. Here there are 71 coke plants, eight of which are equipped with apparatus for the recovery and rectification of benzol; 21,796 beehive and 2558 byproduct ovens are included in this district.

In the corporation's southern coal and coke property there are 190,696 acres of mineral and surface lands; this includes 139,329 acres of mineral only and 13,823 acres of surface only. There are located on developed sections of this property nine coal-mining plants comprising twenty operating mines, producing coal both for shipment and for manufacture into coke. In connection with these coal-mining operations there are ten coal-washing plants and seven coking plants, the latter comprising a total of 2974 beehive coke ovens. At Fairfield, Ala., there is located a byproduct coke works consisting of 280 ovens, with 154 additional ovens under construction to be ready in part by July, 1919. A benzol recovery plant is connected with this byproduct plant.

In the Pennsylvania Connellsville coke region the corporation's subsidiary companies own water-supply plants, consisting of 13 reservoirs and six pumping stations with a distributing system of pipe lines aggregating about 92 miles in length. These plants have a daily capacity of 18,000,000 gal., furnishing water for use in manufacturing coke and, in addition, supplying water to three municipalities.

Nitrogen Decreases with Carbonization

Nitrogen in coal is of uncertain occurrence. In the analyses contained in Bulletin 22 of the Bureau of Mines, the highest content of nitrogen in what is commonly, even though erroneously, called pure coal substance (casting out certain obvious errors in tabulation) is 2.65 per cent. The coal containing this percentage comes from Carbonado, Pierce County, Washington. It is a bituminous coal having 29 per cent. of volatile matter and about 5 per cent. of moisture. The same ash-moisture- and sulphur-free analysis of an extremely anthracitic coal at Portsmouth, R. I., ran only 0.12 per cent. In general the more complete the carbonization the smaller the nitrogen content, but there are several exceptions to this extremely rough rule. It is probably true of any one type of coal that the nitrogen content of so-called pure coal substance decreases with carbonization.

As an example of this, the best hardness test obtained in the series quoted above corresponded to an average volatile test of 19.60 per cent. Another mixture of Durham and Cardiff coal, however, has given a maximum hardness test for the coke of 1000 lb. per sq.in. with proportions representing only 16 per cent. of volatile matter in the mixture; and when this content was raised to 19 per cent. the coke lost all cohesive properties, and its resistance to crushing fell to zero.

Charpy and Godchot have also investigated the effect of using resins and tar as substitutes for volatile matter, in order to improve the coking properties of

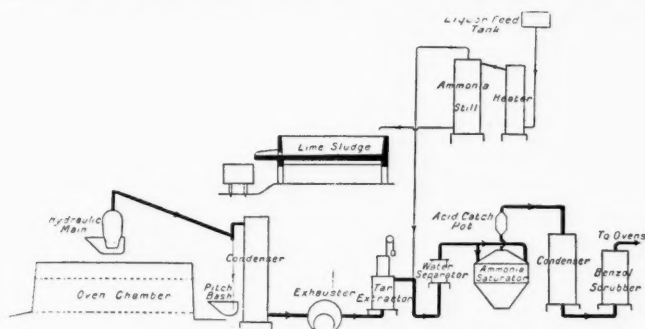


FIG. 2. LAYOUT OF BYPRODUCT RECOVERY PLANT

lean coals. They have found that in both cases remarkable increases in the hardness of the coke can be attained when the correct proportion of the volatile bituminous matter has been ascertained by laboratory trials.

For example, the de Brassac coal referred to above, containing only 11 per cent. of volatile matter, when carbonized with sufficient resinous matter to raise the percentage of volatile in the mixture to 14 per cent., showed a gradually increasing hardness. When the volatile matter reached 28.8 per cent., the hardness test showed 1842 lb. per sq.in. Similar results were obtained by using tar in the carbonizing apparatus.

Finally, Charpy and Godchot investigated the effects of carrying out the carbonization of highly bituminous coals in two stages, the Durham coal used for these tests containing 28.1 per cent. of volatile matter. The first heating was carried out at 450 deg. C. (842 deg. F.) and covered various periods of time. The carbonization was then completed at 700 deg. C. (1292 deg. F.). The results obtained are given in Table II.

The results in Table II prove that a coal which in the natural state is quite useless for producing hard coke, by means of a preliminary heating at 450 deg. C. can be converted into one which will yield a coke of normal quality and hardness.

The importance, therefore, of carrying out preliminary trials with various coals and mixtures, in order to ascertain the best conditions and proportions for carbonization, is emphasized by these tests. The authors claim thus to have indicated a simple and easy method for this purpose. The full text of this valuable

TABLE I. TESTS WITH "DE BRASSAC" AND DURHAM COALS

Test No.	British Durham Coal, with 24 per Cent. Volatile, Parts per 100 in Mixture	French "de Brassac" Coal, with 11 per Cent. Volatile, Parts per 100 in Mixture	Resistance to Crushing of the Coke, in Lb. per Sq. In.
1	20	80	0
2	25	75	292
3	44	56	640
4	51	49	1140
5	56	44	0

TABLE II. CARBONIZATION TESTS OF DURHAM COAL

Preliminary Distillation at 450 Deg. C.	Per Cent. Volatile in Residue	Quality and Hardness of Coke Obtained After Final Carbonization at 700 Deg. C.
Duration, Minutes		
0	28.1	Coke porous and very friable
30	23.5	Coke porous and very friable
60	22.2	Coke porous and very friable
90	21.4	Coke porous and very friable
105	20.0	Coke hard; mean of 3 tests 583 lb. per sq.in.
120	18.1	Coke hard; mean of 3 tests 1387 lb. per sq.in.
150	16.6	Coke hard; mean of 3 tests 356 lb. per sq.in.
165	14.8	Coke powdery

contribution to the scientific side of coking practice will be found in *Comptes Rendus*, 167 (Aug. 26, 1918), pp. 322-324.

Newton Chambers & Co. has erected recently a battery of 37 coke ovens and a byproduct recovery plant in connection with a blast-furnace installation. As this new equipment embodies many of the latest improvements in the Semet-Solvay type of regenerative byproduct coke oven, it appears worthy of a description.

Fig. 1 shows the general arrangement of the coke-oven plant and Fig. 2 that of the recovery plant. Fig. 3 shows sectional elevations of the oven, both longitudinal and transverse.

The slack used is brought from the firm's own colliery by rail and is dumped into an elevator serving a Baum type of coal washery. This washery separates it into nuts, beans, peas and fine coal, the respective sizes and percentages of these grades, obtained from the unwashed slack, being as follows:

Name	Size, In.	Percentage
Nuts.....	2 to 1½	15
Beans.....	1½ to 1	10
Peas.....	1 to ¾	10½
Fine.....	¾ to 0	57
Dirt.....		7½

The washed and graded nuts, beans and peas are delivered into separate bunkers and thence discharged into railroad cars and sold, while the fine coal, amounting to 57 per cent. of the total, is passed on to drainers, then to crushers, and finally arrives at the service bunker of the coke-oven battery. This holds 750 tons, or over two days' supply. This bunker is built of

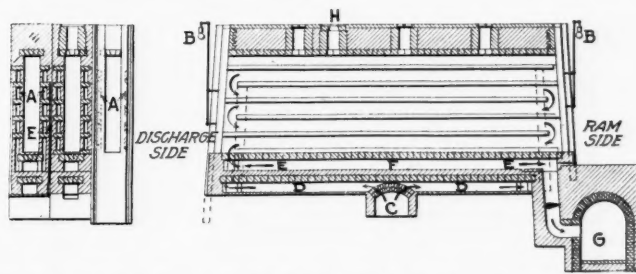


FIG. 3. SECTIONAL ELEVATION OF LATEST TYPE OF SEMET-SOLVAY COKE OVEN

reinforced concrete and is of tank form, with one hopped outlet.

The washed and disintegrated crushed coal is delivered from this hopped outlet onto a revolving feed table, from which it is passed by a Robin's belt conveyor to the compression box of the oven-charging machine. This machine is of the combined ramming and charging type and is strongly built, as the ovens are of 12-ton capacity and thus take 50 per cent. larger charges than has been customary hitherto with Semet-Solvay ovens in the United Kingdom. Two stamping machines compress the charge in the box; and by means of an automatic reversing distributor the belt conveyor is

made to deliver its charge over the whole length of the compression box, and thus to promote uniformity in the quality and density of the coke produced.

The ovens are 9 ft. 10 in. high by 36 ft. long, and are of the horizontal flue type, as shown in the sectional elevation, Fig. 3. The air for combustion is preheated to about 300 deg. C. (572 deg. F.) by circulation under the bench of ovens in the flue *C*; and the waste gases from the ovens, with a temperature of 850 to 900 deg. C. (1562 to 1652 deg. F.), are drawn off by the main collecting flue *G* and are used for steam raising, together with the surplus gas from the ovens not required for heating the battery.

The quantity of air supplied to the top burner is greatly in excess of the theoretical quantity required for complete combustion, and this excess is heated in its passage along the flue to a temperature of about 1000 deg. C. (1832 deg. F.) and passes with the burned products into the next flue. Here it provides the free oxygen to burn the gas admitted into the second flue. The excess of air in the burned products from the flue above is such that even in the third and any subsequent burners little additional air is necessary to complete combustion. It is gradually consumed in its second and later traverses, without exceeding in total the theoretical quantity. The burned products make five successive traverses in the heating flues, and as they sweep through the flues, increasing in volume and velocity, combustion is gradually completed, with a minimum of burned products, and with what is claimed to be a very perfect distribution of the heat over the whole surface of the wall.

The gases evolved from the coal in the process of

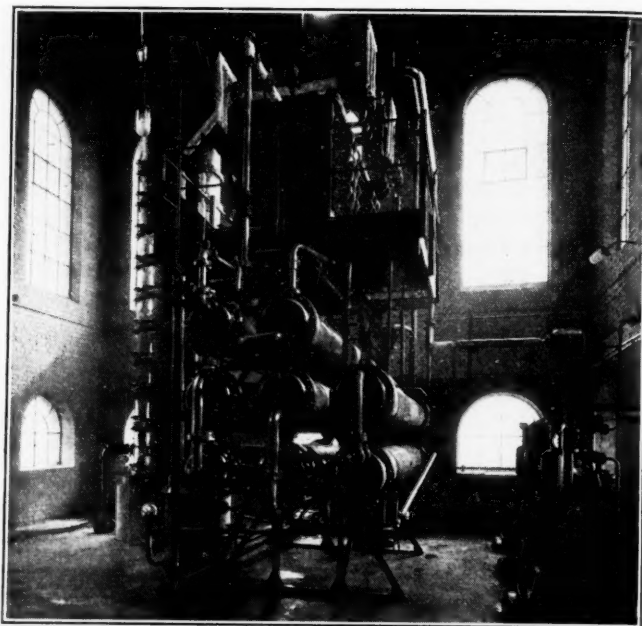


FIG. 4. INTERIOR OF BENZOL RECOVERY PLANT

carbonization pass through the outlet in the roof of the oven into the hydraulic main, from which they are drawn, under the influence of an exhaustor, through condensers and washing or absorbing apparatus, in which they are deprived of the ammonia, tar and light oils which they contain. Thus dried and purified, the gases are returned by the exhaustor to the distributing main *B* to be burned—the main part in the heating flues and the surplus at the boilers.

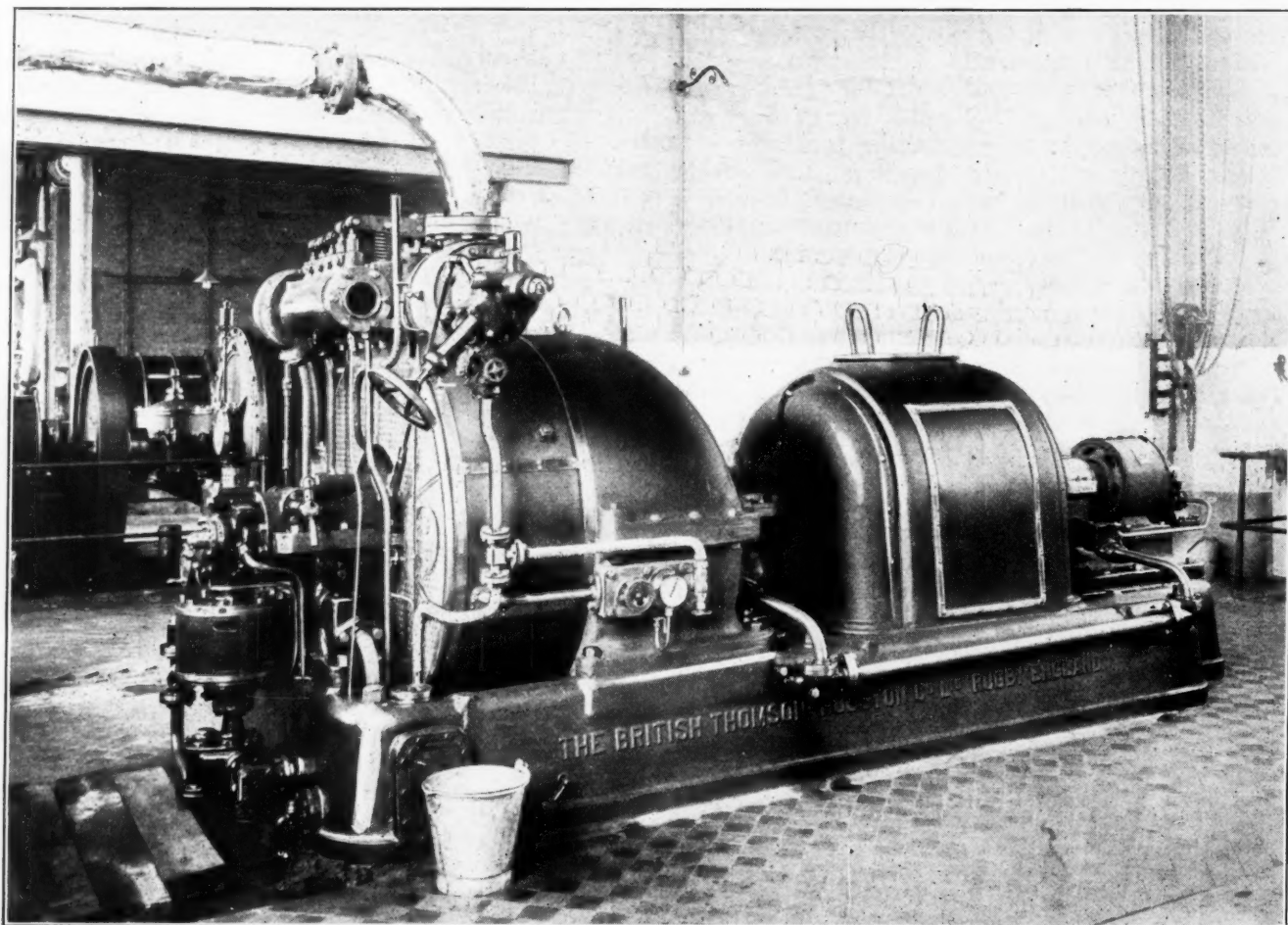


FIG. 5. TURBO-GENERATOR USED AT NEWTON CHAMBERS & CO. PLANT

As regards the capacity of the new plant, it is estimated that as the ovens are of 12 tons capacity and the coking period 34 hours, the output will be 220 tons of coke per day, with corresponding amounts of benzol, ammonium sulphate and other byproducts. The battery of 37 ovens should therefore serve to coke 2200 tons of coal per week (calculated on a dry basis) and the waste gases should raise 26,000 lb. of steam per hour, in the waste-heat utilization portion of the plant. This consists of five double-flued Lancashire boilers equipped with brick-lined fronts and Terbeck burners, and a Green economizer, by which the feed water is raised to 265 deg. F.

Turning now to the arrangement of the recovery plant as shown in Fig. 2—the coke-oven gases are drawn by the exhaustor from the hydraulic main, through a series of condensers equipped with horizontal water-cooled tubes, in which they are cooled, and much

sulphuric acid in the saturator in order to obtain ammonium sulphate. The crystals of this salt are removed as they are formed, by an air ejector, and after draining are dried by centrifugal action.

The lime liquor that flows from the ammonia stills is allowed to settle in large tanks. The clear liquid is used for quenching the coke while the lime sludge is discharged into wagons and is sold to farmers for agricultural use.

The gases that escape from the saturator, carrying the benzol vapor, have first to be recooled. For this purpose they are passed through a series of six Reutter condensers, equipped in such a way that the cooling water can be used either in parallel or in series. The cooling effect can thus be varied effectively, according to the temperature at which the gases enter the condensers.

The cooled gases are then passed through a Solvay

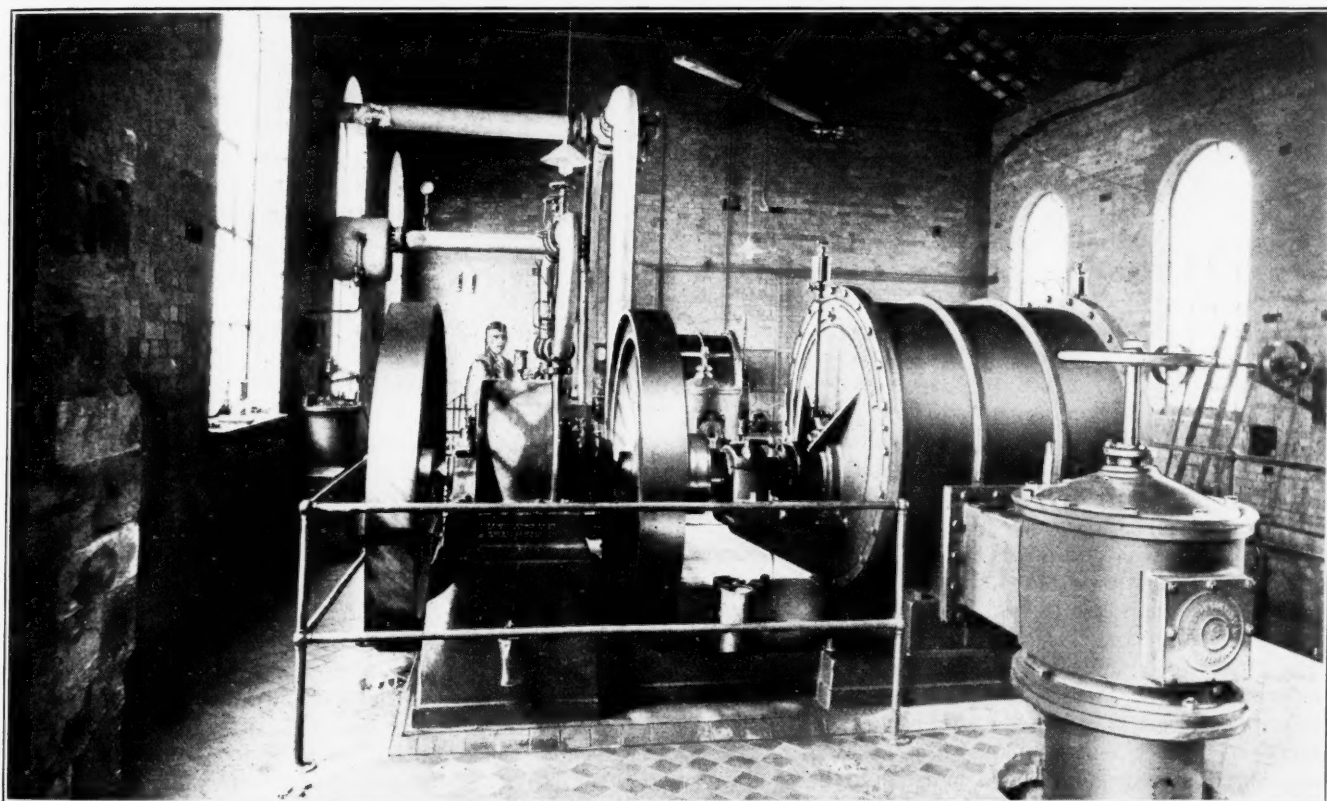


FIG. 6. VIEW OF THE INTERIOR OF THE EXHAUSTOR HOUSE

of the tar and tar water is condensed to liquid form. Only one condenser of the group is shown in the diagram, and only one exhaustor. Several condensers and two exhaustors are provided, the latter being both steam-driven, although most of the other power required about the plant is provided by an electric generating station.

At this stage the gases are passed through Pelouze and Andouin extractors to remove the last traces of tar mist, and on issuing from these they possess a temperature of about 30 deg. C. (87 deg. F.), and still contain about one-fourth of their original ammonia, the other three-fourths being found in the tar water and liquor. The ammonia is separated from this liquor by distillation with lime. The combined gases, after cooling and equalization of temperature, are passed through a "separator," in order to extract some of the water vapor, and are then bubbled through

type of benzol scrubber, consisting of a number of tray compartments, the adsorbing oil being fed in at the top and the gases entering the scrubber at the bottom. The effectiveness of this "stripping" operation depends upon the temperature at which the gases enter the scrubber, upon the quality of the wash oil used, and upon the number of tray compartments with which the apparatus is equipped. Good design and management are also necessary to obtain the best results. The benzol is finally separated from the oil in a Solvay type of still, from which oil is returned to the scrubber for further use.

The electrical apparatus that provides all the power and light required consists of a 500-kw. steam turbo-alternator, the turbine being of the three-stage, high-pressure Curtis type, running at 3000 r.p.m. and consuming 20.2 lb. of steam per kilowatt-hour. This figure covers all losses in the generating plant. The

three-phase current is generated at 3300 volts pressure, and is transformed to 550 volts for use in driving the machinery used in the washery and coke-oven plant. Fig. 4 shows the benzol recovery plant, Fig. 5 the turbo-generator and Fig. 6 the exhaustor.

The fact that a washed fuel that has been stocked for some time in the open, and thus exposed to atmospheric influences, loses some of its coking qualities has been long known in the coking world. Should the use of stocked coal be necessary, in order to keep any byproduct coke-oven plant in operation, it is better to employ a coal that has not been submitted to a preliminary washing.

THE INFLUENCE OF MOISTURE UPON BYPRODUCT COKING RESULTS

The cause of the greater loss of coking qualities which a washed coal undergoes by storage is the more rapid oxidation change which occurs when the coal is moist, this acceleration of oxidation being caused partly by the higher temperature which reigns in the interior of the stocked heap of coal, and partly by the action of the water in penetrating cracks and crevices of the coal, thus exposing fresh surfaces of the lumps to the action of the air, as the moisture evaporates and the coal breaks into smaller pieces by disintegration.

For immediate use, however, washed coal is better than unwashed for coking purposes, since not only is it possible to reduce the ash and dirt considerably by the process of washing, but this process enables the coke-oven manager to introduce the coal into the coking ovens with the most advantageous amount of water—namely, 9 to 12 per cent. Below 9 per cent., the yield of byproducts is reduced considerably, while above 12 per cent. the loss of heat and damage to the walls of the coke oven are excessive. Coal in its natural condition seldom contains more than 5 per cent. of moisture when delivered to the consumer (unless it happens to come from a very wet mine). It follows that the best percentage of moisture in coal intended for coking purposes, can only be attained by artificial means. A washing plant is therefore a necessary adjunct to the modern coke-oven installation, for in such a case the percentage of moisture in the washed coal is under the control of the coke-oven manager, and by good plant design and management it is possible to have always a good supply of washed coal on hand testing between 9 and 12 per cent. of moisture.

If coal is left too long after washing the moisture will drain away and the washed fuel will show only 5 per cent. or less of water, so that care and organization are required if the coal when charged into the ovens is to test within the limits named above. As proof that a washed slack, if left to drain, will dry down to quite a low percentage of moisture, the following tests made in my own laboratory, upon washed fuels from the South Yorkshire coal field may be quoted:

No. of Sample	Percentage of Moisture	Percentage of Ash	Calorific Values of Dry Fuel
1	4.70	3.30	14,787
2	2.05	5.50	14,626
3	1.83	4.85	14,637
4	2.75	3.25	15,048
5	5.73	5.80	14,387
6	5.10	5.70	14,385

With regard to the effects of moisture upon the yield of byproducts, the explanation for a higher yield of ammonia appears to be that the larger amount of

moisture to be evaporated keeps down the oven temperature and thus prevents decomposition of the ammonia by heat; and that the moisture evaporated condenses with the tar and washes the ammonia salts out of it during its condensation to liquid form.

Two other advantages of charging into the ovens coal containing from 9 to 12 per cent. of moisture are that it is then easier to obtain compressed cakes or blocks of sufficient strength to resist the mechanical stresses of charging; and also that the heat of the oven during the charging operation is expended in drying the outer layers of the block, and there is consequently less escape and loss of gas than when a drier coal is employed for charging the ovens.

As regards the best method of sampling and testing the coal for moisture, it is necessary to point out that to obtain an accurate sample of a large heap of wet fuel is not at all an easy matter, and that the results of the test when obtained are only approximate. The most reliable sample can of course be obtained when the coal is being stamped into the box of the charging machine.

If the coal is sampled from the heap or from storage bunkers, it will be necessary to take quite a large number of shovelfuls from various parts of the heap or bunker, and to follow in general the plan of sampling, described in the Bureau of Mines Bulletin No. 116, on this subject.

It will also be necessary to quickly crush the sample of the fuel so obtained down to pea size. One pound of this rough sample should then be weighed out upon a tarred soup plate or other container and be placed under cover in some warm place such as upon some part of the brickwork of a boiler setting, where the plate and its contents will attain a temperature of 110 deg. C. (230 deg. F.) and with frequent turning over of the fuel kept at that temperature for 2 hours. The loss of weight in grams, divided by the factor 4.54, will give the percentage of moisture yet remaining in the sample being tested.

After some experience in the rate at which the stock of each class of washed fuel drains and dries, the coke-oven manager will be able to tell, to within 1 to 2 per cent., when the coal is ready for use. The appearance of wetness varies greatly with different coals, and a determination of the moisture (as described above) is the only really safe indication of the amount of water actually present in the fuel at the time of charging.

Large Tonnage of Pyrite Available

A production of 1,456,000 tons of coal pyrite could be made available in the East and Middle West if a price of 20c. per unit could be obtained for the material f.o.b. at the mines. The estimate, made by the Bureau of Mines, covers only recoverable pyrite with a sulphur content of more than 40 per cent. and includes only those mines that could produce 1 per cent. or more of their coal production as coal pyrite. The estimate is divided as follows:

	Tons per Year
Kansas	125,000
Missouri	175,000
Iowa	140,000
Illinois	238,000
Indiana	250,000
Kentucky	25,000
Tennessee	56,000
Michigan	12,000
Ohio	235,000
Pennsylvania	200,000
Total	1,456,000

Comparison of Bituminous and Anthracite Statistics for Pennsylvania—1918

BY R. DAWSON HALL
Associate Editor, *Coal Age*

A COMPARISON of the anthracite and bituminous coal industries in the State of Pennsylvania will possibly remove many misconceptions. It will be noticed from the table that the bituminous production in that state alone is 78 per cent. larger than the output of the anthracite mines. The amount of bituminous fuel shipped as coal is not in equal proportion because a large amount of the bituminous coal—18.24 per cent., to be exact—was used in 1918 for the manufacture of coke. However, the bituminous coal shipments exceeded the shipments of anthracite coal by 60 per cent.

The anthracite region has nevertheless some figures larger than any the bituminous region can advance. Though the bituminous field produces 78 per cent. more coal, the anthracite field uses 2.5 times as much coal in securing its quota. This important fact may be put more plainly as follows: The anthracite mines use 0.103 tons, or 205.4 lb., of coal per ton produced for

really know in most cases what kind of coal is actually used in the raising of the steam. In both bituminous and anthracite mines the boiler equipment is usually out of date, though nowhere is that equipment as ancient as in standby plants of the latter region.

It may well be surmised that the large amount of coal used in the anthracite region arises in part from incomplete electrification. Long, improperly protected steam lines waste large quantities of good fuel. In many cases coal has to be hauled long distances on the surface to reach the breaker, and haulage of this kind when not electrical involves the use of much coal of good quality. The anthracite region needs to transmit its power electrically. The record suggests, if it does not prove, that the need is urgent for further electrification. Certainly efficiency has plenty of ground to work on at mines where one ton in ten is used for power purposes.

COAL PRODUCTION, LABOR AND FATALITY STATISTICS OF PENNSYLVANIA, 1918

Production	Bituminous Coal Mines		—Anthracite Mines—		—All Coal Mines—		Bituminous	Anthracite
		Per Cent.		Per Cent.		Per Cent.	Anthracite	Bituminous
Shipped to market, net tons.....	138,303,582	78.042	86,614,365	87.097	224,917,867	81.297	1.597	0.626
Used at mines, net tons.....	4,081,971	2.303	10,211,077	10.268	14,293,048	5.166	0.400	2.502
Sold to local trade, net tons.....	2,506,602	1.415	2,620,128	2.635	5,126,730	1.853	0.957	1.045
Used for coke, net tons.....	32,325,038	18.240	.....	.....	32,325,038	11.684	Infinite	Zero
Totals and ratios of totals.....	177,217,113	100.000	99,445,570	100.000	276,662,683	100.000	1.782	0.561
Coke production, net tons.....	21,681,825	67.074*	.....	.....	.....	.....	.....	.....
Labor:								
Employees inside.....	136,715	77.907	102,085	68.871	238,800	73.769	1.339	0.747
Employees outside.....	38,771	22.093	46,141	31.129	84,912	26.231	0.840	1.190
Totals and ratios of totals.....	175,486	100.000	148,226	100.000	323,713	100.000	1.184	0.845
Net tons per inside employee.....	1,296.25	.....	974.14	.....	1,155.86	.....	1.331	0.752
Net tons per outside employee.....	4,570.87	.....	2,155.25	.....	3,258.23	.....	2.121	0.472
Net tons per employee.....	1,009.87	.....	670.91	.....	854.66	.....	1.505	0.664
Fatalities:								
Fatal accidents inside.....	445	90.816	458	81.786	903	86.00	0.972	1.029
Fatal accidents outside.....	45	9.184	102	18.214	147	14.00	0.441	2.267
Totals and ratios of totals.....	490	100.000	560	100.000	1,050	100.00	0.875	1.143
Fatal accidents per inside 1,000 inside employees.....	3.255	.....	4.486	.....	3.781	.....	0.726	1.378
Fatal accidents outside per 1,000 outside employees.....	1.161	.....	2.211	.....	1.731	.....	0.525	1.905
Fatal accidents per 1,000 employees.....	2.792	.....	3.778	.....	3.244	.....	0.739	1.353
Net tons per fatal accident inside.....	398,240.70	.....	217,130.07	.....	306,381.71	.....	1.834	0.545
Net tons per fatal accident outside.....	3,938,158.08	.....	974,956.57	.....	1,882,059.06	.....	4.039	0.248
Net tons per fatal accident.....	361,667.57	.....	177,581.38	.....	263,488.26	.....	2.036	0.491

* Percentage of coke to coal used for coking.

power purposes. The bituminous mines use only 0.023 tons, or 46 lb., per ton of output. Thus the bituminous mines are 4.46 times as sparing in the use of coal for power as the anthracite mines.

Probably much of the difference cannot be avoided, for the amount of water to be pumped, the height of the lift, the length of the hauls, the hoisting and preparation costs are all against the anthracite region. But in this connection it must be remembered that the bituminous mines do much of their cutting by machine, whereas only a comparatively small amount of anthracite is thus cut. However, the coal used for power at the coke ovens in the bituminous regions in a degree balances the use of anthracite for fuel preparation in the hard-coal region.

In both the anthracite and bituminous regions the poorer coal is supposed to be used exclusively for steam-raising, but at most of those mines which do not have automatic stokers the better coal is used quite frequently; and the higher officers of the company do not

The tonnage of coal per employee in the bituminous region during 1913 was 837 tons, but the number of days worked was only 232. It is a big improvement when, as in 1918, the average man puts out 1296 tons even though he has the advantage of steadier work. The anthracite region during 1913 put out 520 tons per man, the number of working days being larger; namely, 257 as against 232 in the bituminous region. During 1918, with the impetus resulting from the war, the production per man rose to 974 tons.

Do these facts taken by themselves give a true index of patriotism? In 1918 the bituminous region bettered the record per man of 1913 by 54.8 per cent. The anthracite region improved its record 87.3 per cent. and did it with apparently less increase of time.

However, till we know how steadily each section had an opportunity to work, comparisons are unfair. It is well known that in the early part of 1918 the car supply in the bituminous region did not compare with that of the anthracite region.

News From the Capitol

By Paul Wooton



Coal Industry Would Be Hampered by Continued Federal Control

Discussion of continued Federal control of the coal industry leads George H. Cushing, the secretary of the American Wholesale Coal Association, to outline a course which he thinks should be pursued in this matter. He says:

The coal industry is divided into three parts—production, wholesaling and retailing. While each is distinct from the other two, they are as inseparably parts of a common enterprise as are the head, arms and feet of the body. They are one in objective and obligation. Therefore, no safe program for coal can be devised which does not rest upon the sanction and approval of all three.

Our civilization is built around the use of power. The generation of power demands the consumption of coal. Coal is the one dependable and essential fuel. Therefore, the immediate safety of our civilization depends upon an adequate production of coal. Our future safety depends upon the careful use—and hence conservation—of our coal today.

For these reasons the public has deep interest in coal. No program can be adopted safely which leaves the people in ignorance. Therefore, a necessary preliminary to any program is an elaborate publicity campaign. Without it coal is in danger of being misunderstood.

The most potent cause of waste in coal-mine operation is the fact that each existing mine must compete not only with all other existing mines but, potentially at least, with all the mines which can be opened into all the coal lands in the United States. That is, so soon as coal mines become uniformly profitable, enough new mines can be opened into the reserve coal land to throw the industry into practical insolvency. This degree of competition is wasteful of our coal measures because it compels the operator to take only the cream of his coal, leaving unrecovered and unrecoverable in the ground a percentage of his precious deposit.

Such intensely competitive and wasteful practices in production induce equally intensive and wasteful measures in wholesale and retail distribution. Thus the public and the industry suffer together. This practice cannot long endure.

To the end that competition may be kept in limits comparable to those in other industries, I believe:

First, that the Congress of the United States should declare by resolution that, for the purpose of legislation, the extractive industries should be put in a class by themselves.

Second, that, to ascertain what other helpful measures are needed at once in the coal industry, the Congress of the United States should at once provide for an inquiry into the economics of the coal industry; should provide money to defray the necessary expenses of such an inquiry; and should empower the President of the United States to appoint a commission—nominated to the President by the various interests concerned—representing the public, the users of steam coal, the operators, the wholesalers, the retailers and the miners.

It has been fully demonstrated in this and other nations that Federal control or detailed Federal supervision of an industry results in the dwarfing of the economic development of the controlled industry.

The coal industry of the United States is not, in the matter of efficiency, developed to the point where its growth can safely be checked. For years to come, it must be left free to develop and expand into a truly efficient industry through the operation of that kind of moderated competition practiced in all other industries.

Therefore, I believe:

First, that it should be the announced policy of the people of the United States to leave the coal industry free from detailed control or restraint until moderated competition operated upon by enlightened self-interest has developed an efficient industry.

Second, that it should be the announced policy of the Federal Government to build up an educational organization within one of its departments which should study to improve the business methods employed by the coal industry and to encourage the use of these improved methods by the coal companies.

New Contingent Fee Clause Part of All Railroad Administration Contracts

A new contingent fee clause is being inserted in all Railroad Administration contracts. This is the result of opposition to the old clause. The coal industry was importantly represented in this opposition. The official statement issued in this connection reads as follows:

Walker D. Hines, Director General of Railroads, announces that, with the approval of Attorney General A. Mitchell Palmer, he has consented to a modification of the covenant inserted in purchase contracts under the direction of the Department of Justice issued June 18, 1918, prohibiting the payment to agents of fees contingent upon the procuring of contracts with the Government in so far as it relates to railroad contracts.

Since this order was promulgated by the Attorney General there has been a good deal of complaint from railway supply houses that its provisions were working a hardship upon them and that the Government itself was losing the benefits of a system which, previously, had proven both economical and satisfactory in every particular.

Hereafter the Attorney General's order will not affect contracts made between the Railroad Administration and supply houses which, previous to Government control, carried on their business through bona fide selling agencies.

At the suggestion of John Barton Payne, general counsel for the Railroad Administration, the following clause will be inserted in appropriate cases in future contracts:

"Provided, however, that this covenant shall not invalidate a contract obtained through a bona fide commercial representative employed under a general contract covering designated territory and shall not prohibit or penalize the employment of the same agencies, rates and methods of compensation in dealing with the United States heretofore customarily employed by the contractor in the regular course of his business in similar dealings with the railroad corporations."

Government Interested in Development of Inland Waterways

Extensive use of the inland waterways of the country in coöperation with the railroads is urged by the Director General of Railroads in outlining his waterways policy. He believes joint rates should be made and through bills of lading issued. If the railroads are turned back to their owners, Director General Hines favors the continuance of Government operation of the lines established by the Government on inland waterways. He tells what the Government has done in this connection. With regard to the coal-carrying barge line on the Warrior River, he says:

Service on the Warrior River was delayed because of the difficulty in obtaining and equipping available craft. This service was inaugurated December last, chiefly for the transportation of coal. Joint through rates on coal, in connection with the rail carriers in that district, are being actively considered. The present service provides ample outlet for mines directly on the banks of the Warrior River and without rail connection. Equipment to make practicable the carriage of general merchandise by existing craft is now being designed. This will link the water service on the Warrior River with that on the lower Mississippi, and a comprehensive system of joint water, as well as water-and-rail rates between these two water projects is being developed.

For the Warrior River \$698,241 has been expended for the purchase of three wooden towboats, twenty-three 500-ton wooden coal barges, three harbor transfer coal barges and six self-propelled steel barges of an average capacity of 825 tons each. Contracts have been awarded for the construction of four self-propelled steel barges, with a capacity of 1800 tons for coal loading, but equipped to load up to 400 tons each of merchandise provided the coal loading is correspondingly decreased. These barges are for service between Cordova and New Orleans.

Bids have been received and contracts are about to be let for three steel towboats for service between Cordova and Mobile.

Contracts have been let for twenty 500-ton wooden coal barges for service between Cordova and Mobile. The aggregate contract price under these contracts for Warrior River equipment is \$1,508,300.

Most of the old equipment purchased as above stated, for use on the Warrior River, is now in operation.

The four self-propelled barges for which contract has been let are expected to be completed early in the fall. The three twin-screw towboats for which contracts are about to be let are expected to be completed about the same time. The twenty wooden barges will be completed between Apr. 1 and June 1, and, pending the completion of the towboats above referred to, towboats will be leased to propel these barges.

With regard to the Chesapeake and Ohio canal, Mr. Hines says:

The Chesapeake and Ohio canal was never operated by the Railroad Administration. At the beginning of the season of 1918, on account of increase made by the canal trustees in toll rates and the increases in operating expenses, the Canal Towage Co., which was the only company operating boats on this canal, announced that it proposed to discontinue operations, as it could not pay operating expenses.

In order to avoid the loss of this means of transportation of coal to Washington and vicinity during the acute congestion which then existed on the railroads and the shortage of coal which then appeared imminent if war conditions continued, the Director General of Railroads at first made an arrangement whereby he assumed payment of the canal tolls on coal traffic on the Chesapeake and Ohio canal. Later in the season, in connection with the increases made in rail freight rates on coal, this arrangement was revised so that for the balance of the season the Director General of Railroads assumed the actual deficit of

the Canal Towage Co. in operating its boats. This was substantially less per ton than the canal trustees charged for tolls, the Canal Towage Co. under this arrangement paying such tolls.

For the same reasons which led it to pay part of the expense of operating the canal, the Railroad Administration constructed ten new canalboats to increase the tonnage transported via this canal, these boats being leased to the Canal Towage Co. for operation.

The Railroad Administration has made no arrangement with the Canal Towage Co. to pay any part of its operating expenses for the present year. The same emergency does not exist as obtained last year. Arrangements, however, have been made for divisions between the railroad and the canal of the freight charges from the mines to destination which will make it possible for the Canal Towage Co. to operate its boats on the canal during the coming season as heretofore, and the boats built by the Railroad Administration will be operated by the Canal Towage Co. on a rental basis.

Railroads Will Make Public All Details Concerning Coal Contracts

The National Coal Association feels that its contention with the Railroad Administration is more than half won as a result of the following order which has been issued by the Director General of Railroads:

In order to make effective the policy already announced as to publicity in connection with railroad fuel contracts, it has been decided to post on all bulletin boards or in a record book open to the public at the headquarters of the purchasing agent of each railroad under Government operation the following facts: The name of the coal company or coal operator to whom a contract for railroad coal has been allotted by the railroad in question, the price of the coal contained in the contract, the tonnage involved in the contract, the duration of the contract. Through this method the information listed above will be made available not only to coal miners and coal operators, but the public generally.

Government Fuel Yard Soon To Operate

Director Van H. Manning, of the Bureau of Mines, is authority for the statement that the Government coal yard in Washington will begin operations about May 1. When completed this yard, which is located at the New Jersey Avenue freight yard, will be the largest plant of its kind in the United States. It will furnish coal to the Government and municipal departments in the District of Columbia.

The yard covers approximately three acres and will handle about 400,000 tons of coal a year. It has a daily capacity of 1200 tons and storage space for 30,000 tons. The yard will in no way interfere with the local coal dealers, and is solely for Government use. For years the local dealers handled the Government coal, and last year the Department of the Interior thought it could institute economies in coal purchases by handling its own coal, and accordingly did so.

So successful did this coal-handling department prove during the coal shortage in the winter of 1917-1918, that Congress appropriated \$432,300 for the establishment and operation of a Government coal yard. George S. Pope is chief engineer of the fuel yard and R. A. Dye chief clerk.

June 3 has been chosen as the date for the annual meeting of the American Wholesale Coal Association. The meeting will be held in Cleveland.

EDITORIALS

Buyers Have Duties But No Consciences

A WAY WITH double standards! If it is wrong for a seller to "bull" prices by refusing to sell at reasonable figures, it is wrong for the buyer to seek to "bear" prices by declining to buy when a reasonable offer is made. The buyer is the most unconscionable rascal in the body politic, but he does not know it. He ties up business at will, lays workmen idle, evicts the poor, lowers the productive capacity of the world, and inflicts endless misery in the hope of decreasing wages.

A sorry person he is indeed. He has unconsciously bought up the daily press, for the buyers of the country are the readers of the daily papers and the advertisers in daily periodicals. The daily press should be the buyer's father confessor instead of his press agent and confederate. As it is, it keeps his eye closed to the criminality and insensate folly of his way, and spends its unprofitable time inventing stories reflecting on the morality of the producer.

As many as 5000 automatic stokers have been installed on American railroad locomotives. It is therefore important that fine coal delivered to the railroads be free from steel couplings, pieces of wood or chunks of slate, which can do as much harm if thrown into such machinery as if dropped into a reciprocating engine.

Labor Still Climbing a Hill of High Prices

REACTIONARIES may be confident—it is an uncomfortable way they have—that prices are going to come down, but prices will keep on soaring just the same. Certain kinds of labor did so much climbing during the war that "alpinism" has become a habit if not a disease. The hill of high prices is being scaled from all sides. Some working men are finding it necessary to get increases to meet the raised cost of living, and some people are still seeking advances in wages for no better reason than because they find it mighty pleasant to receive them.

As a result of the energetic footwork of the laboring classes and their skill with the alpenstock, prices are going to go up, not down. The hill of high prices has been found scalable from all points of the compass. Though steep as the Matterhorn, the veriest of tyros find it easy climbing.

How can prices do otherwise than rise with the prospect of higher freight rates in view, the outcome in part of a \$65,000,000 increase granted to railroad labor, which, if the presumably well informed are correct in their surmises, is but a forerunner of another advance

that is already under official consideration? The harbor men have been granted a ten-hour day to replace the present day of 12 hours, and they also seek more pay into the bargain. The mine workers, as everyone knows, are agitating energetically for more pay with less work, despite all their many and recent increases in scale. No one expects them to get what they want, but they are seeking it nevertheless. The city firemen, the school teachers and other civil-service employees are looking anxiously for more compensation for their important labors, and in justice to them and to us we must all wish them luck. They will get their

increased pay from the taxes, and the taxpayers must get their money from the public, which means, of course, higher prices.

Look where we will we face higher charges for everything. The best way to meet the situation is to buy now before they go higher and buy even if an immediate profit in the use of the thing purchased seems doubtful or entirely unlikely. For instance, now is the time to erect a factory or a house if one will be needed shortly. It may not be possible to rent out either at a profit. To charge a rent commensurate with cost may subject one to all manner of animadversion as an unconscionable profiteer, but one may be sure that rents will be high enough ultimately to more than justify the premature erection.

All kinds of expenditures for materials and construction for which there is prospective use are justifiable and profitable. "Buy it now" is not so much patriotism as hard-headed sense. "Business as usual" and "Let's go" have been suggested as slogans, but good as they are they fail to recognize the situation as it exists. Perhaps a better legend for reviving business would be "Go while the going is good." Today we can buy more cheaply, more readily and more autocratically from the seller than in the near future. Let us beware of delaying our purchases till prices are up. Everybody will soon be regretting that he did not buy in this, the spring of 1919, and will be recalling that prices sagged a trifle at that time preparatory to a well defined, even if not steep, ascent thereafter.



"If We Break Faith with Them Who Die"

OUR SACRIFICE of human lives is over. Some few have paid the debt in the best they had—in human life and limb. There remains only to be paid the more trifling debt in dollars—bills for contracted material and the cost of maintaining the troops still unmobilized. Most of us wish that we could add some small additional amount to the loan for the purpose of making certain that the discharged soldier would get immediate work without the degradation of pleading for it from door to door, without the uncertainty due to the slackness of employment. But the Government is distressingly inactive this year in building, dredging, railroad and highroad making, and in irrigation activities. It appears to be unusually penurious, though in this, of all years, it should be most energetic.

However, we have the war to pay for and the war to finish. The least, we civilians, can give is our money, and that we are only asked to lend. We must not break faith with those who have died. They fell on the field of carnage to maintain our honor, and we are asked merely to lend our money to maintain it. It is a small service, but unfortunately the smaller the service the harder it is to get it accomplished. It is necessary to bribe the people with a promise to pay 4½ per cent., or 2½ per cent. without taxation, when the public should be willing to lend its resources gratis seeing that the loan goes to pay for the arms, forged to support those who not only *lent*, but *gave*, their lives in battle.

A little service, this purchasing of the Victory Liberty Loan, but it falls to us and we must meet it. *Coal Age* prints a poster today as a loose-leaf insert showing the appeal of Columbia as the representative of those who sleep in Flanders field, at Chateau Thierry, along the Ourcq and the Vesle, along the slopes of the St. Mihiel salient and in other parts of the Argonne. Quoting (with some changes in personal pronouns) Captain John McRae, of Guelph, Can., who gave his life for our common cause, we may well say: To us

" . . . from falling hands they throw
The Torch—be ours to hold it high.
If we break faith with those who die,
They will not sleep tho' poppies grow
In Flanders' fields."

A hundred million people are loudly acclaiming the United States. Let not one of them be found so mean as to fail to give her a full meed of support.

Redfield says prices will fall, but only slowly. Prosperity seekers on the other hand declare that we are due for a long period of stable prices. If either is true why should anyone buy? Rather let us see the facts as they are. Prices are bound to rise, and buying the needful is merely self-defense.

What Is Fuelless in Fuel?

ASKED what are the impurities in coal, we usually say slate, clay, bone and pyrite. This enumeration covers those impurities generally regarded as extraneous, though bone is at least partly intrinsic, and pyrite is possibly rather a segregation from the seam than really extraneous matter. But there are intrinsic impurities—namely, moisture and the incombustible volatile material. The latter is important, for much of the volatile content is really not at all combustible

though many widely known authorities still often term all of it "volatile combustible matter," despite the fact that they know much of it has no heat value. Where the volatile matter is large, it is a sure guess that much of it cannot be burned; for in a chemical sense it has been burned already.

Whether impurities are extraneous or intrinsic, whether they are volatile or incapable of distillation, makes no difference; so long as they are unburnable they are useless for heat raising. They will not pay their freight charges, and coal containing them in excessive quantity must be consumed at or near the point of production and cannot enter into international trade.

Sulphur, however, is burnable. It is only partly to be regarded as an impurity, seeing it has a fuel value. Similarly there probably are some hydrocarbons of low hydrogen content which burn with less heat than is given out by those having a high hydrogen content, and so do not have full heat value. The presence of many of these would lower the heating value of the fuel.

Deductions are inevitably made for slate, clay, bone, pyrite, moisture and incombustible volatile matter in the selling price of the coal. Should deductions also be made in the freight rate, which is somewhat absurd, but not by any means unknown, they still would be objectionable for transportation, because the coal which is admixed with these neutral substances does not burn efficiently; and furthermore, the worthless part of the coal just as much as the better material has to be handled and its ashes have to be removed.

It is for these reasons that only the best coal is welcomed abroad. The man who would buy fuel does not want silicate of alumina, pyrite, moisture or carbon dioxide or, possibly, carbon monoxide. Even washed coal with a 5 per cent. ash that has excessive moisture and much oxygenated carbon is not a desirable fuel. It is good enough within a certain radius of its point of production, but it will not serve for an international fuel.

Walter Hines seems to think that wages are too high for him to furnish the soldier boys with employment. He needs to read the slogan "After the war, a job."

Too Great a Levity Among the Augurs

IT IS said that the Roman augurs were wont to wink at each other as they passed. So likewise the prognosticating and directing augurs at Washington. The Fuel Administrator threatened a coal shortage next winter, and the Railroad Administrator favored Mr. Garfield with a wink, which later broke into a broad smile. They do not take one another seriously in Washington; but, at that, Garfield was not winking. Neale may yet be stumping the country again in the interest of coal production if labor trouble supervenes or Hines delays any longer his coal purchases.

It was loudly heralded that the Administration was going to see that during the reconstruction or readjustment period there would be work for everyone. The nation fearfully expected the launching of chimerical projects. We heard of them, it is true, but that is all. Now we have to complain that even obvious and needful purchases and projects have been wilfully, or should it be said, ruthlessly delayed.

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

American mine workers seem to be taking on a new point of view. In the anthracite region slackness of work has given place to something akin to activity, and the mine workers are better satisfied. In the bituminous region a sort of mental depression in the minds of the employees has resulted from their continued idleness. At first the slackness goaded them into something like defiance. Their complaints were denunciatory in character. The men wanted shorter hours and more pay for the lessened service.

They seemed to believe that all that was needed was that the would-be recipient should ask and he would receive. Now it has dawned on the mine worker that all is not "cakes and ale." He now has taken up the defense instead of the attack. Instead of demanding an increase, he is declaring that he will not stand for a cut.

This is a better attitude. So long as he stands on it he has almost everyone's sympathy except apparently that of the Railroad Administration. A cut in mine labor would open up vistas of possible reductions in all wages. The wage reductionists would hail "the day" which they have been anticipating and toasting. There would be a further period of waiting; business would continue to stand still till everybody had arrived at the conclusion that wage reduction had reached its end.

Wages cannot be much reduced till food comes down in cost. Just now the cost of food is rising. It was 2 per cent. higher in March than in February.

Suppose we had a reduction of mine wages. People might wait a whole year anticipating the fall of more such juicy apples from the tree of present wages, and when they had concluded that no more reductions could come from complaisance on the part of the worker they would then look for further reductions on the ground of a lowering of food prices consequent on the ending of the Government guarantee on wheat. Thus we would have one wait followed by another. It is far better for all concerned to keep wages where they are, for conditions are already shaping themselves to meet them.

Strike To Settle a Long Unsettled Issue

More than 1500 coal miners employed in Arkansas by the Central Coal and Coke Co. of Kansas have struck to compel the company to settle the grievances of its employees at Calhoun, Okla., and in Kansas. An order was issued by Harry A. Garfield, United States Fuel Administrator, directing the men to return to work. Dr. Garfield sent word to John Wilkinson, president of District No. 21, asking him to rescind the order which called out all the 4300 mine workers employed in the Southwest plants of the Central Coal and Coke Company.

Mr. Wilkinson declined to execute the order and said that the strike would continue until a satisfactory settlement had been reached. Dr. Garfield asked that the men submit their grievances for mediation to the labor division of the Administration, under the agreement of July 23, 1917. Mr. Wilkinson replied that the dispute was over machine crews' starting time, that it arose before the inauguration of the Fuel Administration, that it was a question left unsettled by the machine commission designated to make a machine scale and that he "respectfully declined" to rescind the order.

He called Dr. Garfield's attention to the stand of the latter in regard to the McAlester-Edwards Coal Co. dispute at Pittsburg, Okla., where there has been a strike for many months. When the Fuel Administration was asked to interfere in this case, Mr. Wilkinson alleges that

it replied that, after investigation, it had found that it had no authority to force the company's compliance with its orders, because the dispute arose before the inauguration of the Fuel Administration.

All of the mines of the Central Coal and Coke Co. at Pittsburg, Kan., are idle, the 1200 miners of the company not reporting for work Apr. 16, following the strike order issued by President Alexander Howat of District 14.

On Apr. 20 H. A. Garfield, in a message to Alexander Howat threatened to revoke the provision of the agreement of November, 1917, between the coal miners and the coal operators, which gave the miners an increase of \$1.40 a day, unless Howat ordered the striking miners of the Central Coal and Coke Co. to return to work.

Howat in answer wired to Garfield that he rejected "with contempt the cowardly proposition submitted." The miners, Howat wired, are prepared to fight to the last ditch against the automatic penalty clause, which he denounces as "infamous."

Labor Affairs Across the Sea

The mine workers of the United Kingdom of Great Britain and Ireland have approved by a large majority the report of the Sankey Commission. When the Miners' Federation met in conference, on Apr. 16, it was announced that the ballot on the report had resulted as follows: For acceptance, 693,004; against acceptance, 76,992. The conference decided unanimously in favor of the government's terms, which are the same as those put forward in the majority report of the Sankey Commission.

The British mine workers complaint about housing is amply justified. The Sankey report says the houses are "a reproach to our civilization. No judicial language is sufficiently strong or sufficiently severe to apply in their condemnation."

It was stated in one mining district alone there were 2768 persons living more than five to a single room, 1237 more than six to a room, 510 more than seven to a room and 190 more than eight to a room.

The coal-mine workers of Australia are to receive an increase of 22½ per cent. and the price of coal is to be increased concurrently by the sanction of the government. The premier of New South Wales objects vigorously to the change, saying it would increase the fuel bill of that province a half million of dollars a year. Acting Premier Watt of Australia declares the coal shortage grave and likely to close down industry.

On Apr. 16 it was reported that the railroads, short of coal, had taken off the express trains running from Frankfurt and Leipsic to Berlin among many others. The strike, however, was dwindling.

An expert coal council has been created to cooperate with the Economic Ministry in matters of coal production and supply. The council will consist of workmen, producers, consumers, scientists and mine directors and will formulate new laws relating to coal production.

The executive board of District No. 11, which includes most of the Indiana coal field, has protested against a cut in the price of coal, declaring that it would result in a lowering of the mine workers' wage scale. The board sent a communication to W. D. Hines, director-general of railroads, protesting against the proposed reduction in the price of coal to railroads. The miners' officials say that if the railroads are allowed a lower price it would result in the public in general demanding a lower coal rate. At a meeting held in Moose Hall, Clinton, Ind., Apr. 13, the workers of the Clinton coal field showed their approval of the attitude of their chiefs.

Wait Your Turn at the Window, Please



DISCUSSION BY READERS

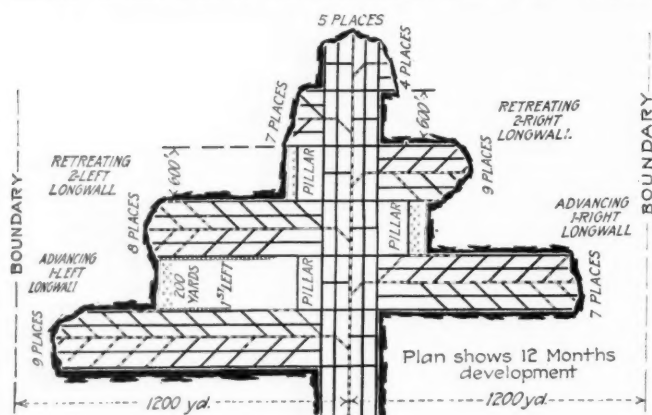
EDITED BY JAMES T. BEARD

A Modified Longwall System

Letter No. 1—The article of F. A. Pocock, *Coal Age*, Feb. 27, p. 395, describes an interesting modification of longwall mining that appears to have for its chief object the extraction of a larger percentage of coal than is possible by any other method, in my knowledge. The article describes this method as applied to the working of a 3-ft. seam of coal under 80 ft. of cover, which is a shallow depth for longwall working.

While the general plan presented appeals to me as well adapted to the mining of 3-ft. coal, there are some changes or modifications that I would make and which seem to me to be very necessary, in this particular case, owing to the tender roof, which it is said will not support itself over any considerable area. I would suggest that, instead of driving the entries 20 ft. wide, the width should be reduced to as near 12 ft. as is possible and avoid paying yardage. This width would still give ample room for the stowage of the waste due to brushing top or lifting bottom on the roads.

In the plan presented by Mr. Pocock, let me say I can see no advantage in driving the diagonal crosscuts shown in the 5-entry side headings, unless the purpose



PROPOSED LONGWALL PANEL SYSTEM

is to preserve the general plan of the diagonal roads common in longwall workings. No line of dip is shown on the plan, and it is only fair to assume that this is a level seam. In the drawing back of pillars, it is found generally better to cross an old place, as I would say "in parallel," rather than otherwise, and then open up a new face on a new set of pillars.

Now, it is a question in my mind whether it is possible to obtain an output of 3000 tons of coal a day, as is claimed for this system. Let me say I would never figure on cutting 10 ft. deep on a conveyor face, as Mr. Pocock proposes to do with the arcwall machine he uses. It may do for the fast places, but I think it will not answer in a longwall face, using a face conveyor.

Allow me, then, to make a brief estimate of what would be the possible output of the mine, in this case, as based on the development, after 12 months. The dotted line showing the working face at this period, in

the plan given by Mr. Pocock, page 395, is, of course, only an approximate line. In the accompanying figure, I have attempted to show what may be taken as a more exact delineation of the work in progress at the end of this 12-months' period.

My plan is drawn to embrace only that portion of the development up to the time mentioned and includes the first, second and third left and right branches, embracing the longwall conveyor faces of the first and second left and the first right. The second right longwall face has not, apparently, been opened at this time, because the third right branch has not been extended far enough to include the 300-ft. pillar protecting the main headings.

ESTIMATED TONNAGE DURING THE FIRST TWELVE-MONTHS' DEVELOPMENT

Now, estimating the output on the assumed basis of Mr. Pocock's figures, with the exception of allowing only a 6-ft. cut on each longwall conveyor face, instead of 10 ft. as he suggests, and counting the number of places in each branch as marked on the plan, taking a cubic yard of coal in place as producing 1 ton of output, gives the following results:

First left branch...	$9(3 \times 20 \times 10) \div 27 = 200$ tons
First left longwall...	$(3 \times 600 \times 6) \div 27 = 400$ tons
Second left branch...	$8(3 \times 20 \times 10) \div 27 = 177$ tons
Second left longwall...	$(3 \times 20 \times 6) \div 27 = 400$ tons
Third left branch...	$7(3 \times 20 \times 10) \div 27 = 155$ tons
Main headings.....	$5(3 \times 20 \times 10) \div 27 = 111$ tons
Third right branch...	$4(3 \times 20 \times 10) \div 27 = 88$ tons
Second right branch	$9(3 \times 20 \times 10) \div 27 = 200$ tons
First right longwall...	$(3 \times 600 \times 6) \div 27 = 400$ tons
First right branch...	$7(3 \times 20 \times 10) \div 27 = 155$ tons

Total 2286 tons

This shows a total output, at the end of a 12-month development, of 2286 tons. In his estimate, page 396, Mr. Pocock has only included the first and second left and right branch headings, and the first left and first right longwall faces, basing this estimate on a 6-month development. By estimating on three shifts a day, he obtains a total of 3322 tons as the possible output at the end of the first six months. In my opinion, this is overestimating the actual possibilities in practice. I have therefore based my estimate on a single shift and limited the undercut to 6 ft. on the longwall faces, while allowing a 10-ft. cut in the headings.

It occurs to me, after a little further study of this plan, that it proposes to work each alternate longwall face on the retreating system. In that case, the first-left and first-right longwall faces would be worked advancing, while the second-left-and-right longwall faces would be worked retreating. That being the case, my estimate should be 400 tons less than that shown above. However, in practice, it is my belief that two-thirds of this estimated amount, or say 1500 to 1800 tons a day, would be all that it would be safe to expect at the end of a 12-month period.

I am pleased to state that the general proposition appeals to me as being well adapted to give a rapid development in the working of a thin seam of coal. But I would suggest that the depth of cover should not be less than 200 ft. to obtain the best results in longwall working. I believe the principles involved in this method are those that must ultimately be applied to work such seams.

W. H. LUXTON.

Linton, Ind.

Perpetuating the Thrift Habit

Letter No. 1—The Foreword in the issue of *Coal Age*, Feb. 6, is a timely presentation of the need of perpetuating the thrift habit. Until recently, it cannot be said that thrift has been a particularly American characteristic. The average American has not chosen to look far enough ahead to create in his mind a desire to save. There are notable exceptions to this rule, however, and the difference between those who have and those who have not formed the habit has proved clearly that thrift is one of the fundamental principles of wealth and independence.

It requires an extraordinary occurrence to revolutionize a fixed habit; and, perhaps, no habit is more fixed among Americans than that of extravagance. Our thrift has been appealed to through our patriotism, in the hour of the country's need. Today, 25 million Americans are feeling a thrill of security through having invested in Government Bonds and War Savings Stamps, while the little Thrift Stamps have made it possible to develop in the youngest child this much-to-be-desired habit.

Could the same noble ideals dominate us, without a recurrence of the world's tragedy, thrift would soon become a characteristic of the average American. No greater blessing could grow out of our overwhelming desire to see the world safe for democracy.

Now that the war is over and there is a tendency on our part to fall back into the old habit of extravagance, the question arises, Is the thrift habit here to stay? No stronger arguments can be presented than those offered in the Foreword to justify the contention that thrift among employees is as good for the employer as for the employed. The man who owns his own home or has his savings invested in Liberty Bonds will not lend an ear to the destructive theories of Bolshevism. On the contrary, the tendency is to make him conservative, loyal to his country and a good citizen.

PROHIBITION A FACTOR IN ADVANCING THRIFT

One of the avenues that has been open, heretofore, to the foolish expenditure of money has been the uncontrolled desire for drink; but the National Congress has now passed the Prohibition Amendment, and we are anxiously watching and waiting to see if it will effectually block this road to extravagance. Experience in the bone dry districts of the past and the failure of local prohibition in places is no proof that nation-wide prohibition will likewise fail. The country is hoping and praying that this will prove an adequate barrier to the great evil of drink.

We must remember, however, that men cannot be forced to save. The appeal to the man must be made through some great channel as that of patriotism to his country, loyalty to his family, and the creation and building up of a strong national characteristic that will

be manifest in the thrift of our people. Even great financial panics have not stimulated men to save against the proverbial "rainy day." The present lull in the country's prosperity has made many a person do some hard thinking of how he could have saved money in the past. Let us hope that the lesson taught will be a lasting one and coming prosperity be attended with the growth of thrift everywhere.

Many communities have started plans tending to induce the thrift habit, by making it possible for a man to purchase a home on practically the same plans that he can rent a house. The incentive of ownership of property is a strong factor in perpetuating thrift. The Carnegie Steel Co., recognizing that fact, has sold stock to its employees, on easy terms, and there are doubtless many other ways of appealing to the self-interest of the individual and thereby nursing the thrift habit. The present bond issue offers another opportunity for the investment of savings that engenders citizenship and creates industrious workers and community builders.

THRIFT ENFORCED IN GERMANY MADE THE WORLD WAR POSSIBLE

Notwithstanding all the evil that has been brought to light by the war, as existing in the German nation, we can afford to take one lesson from that people—it is the lesson of *thrift*. It was the thrift habit enforced on the German people that made the undertaking of a war on such gigantic proportions possible. If the same habit of thrift can be united with our other virtues, which the German people did not possess, we may well feel secure as a nation, for all time to come.

In closing, let me say that the perpetuation of the thrift habit among our people will build for this country an enduring prosperity, but we can do it neither by spending money nor by hoarding money, but only by investing our savings. In this regard much depends on mine managers and leaders of our industries.

Thomas, W. Va.

W. H. NOONE.

To Abolish Illiteracy

Letter No. 1—I was greatly pleased a short time ago to read the editorial in *Coal Age*, Feb. 20, p. 368, bearing on the subject of the widespread illiteracy in this country. The importance of greater efforts being made to wipe out this condition has been brought to light by the facts recorded in the registry of men in the late war. The records show that the large majority of our alien population are unable to read or write the English language, and a good portion of them are no better equipped in respect to their own language.

As stated in the editorial, Senator Hoke Smith, of Georgia, introduced a bill in the last Congress, calling for the appropriation of twelve and one-half million dollars a year, for four years, for the purpose of overcoming this evil. Let us hope that this bill will be amended, before it is passed, making it compulsory for adult illiterates to attend some kind of a school where they can be taught to read and write the English language, and be made acquainted with the principles of American citizenship and American ideals.

The opportunities offered aliens, through the medium of our institutions, to enable them to acquire knowledge were never better than they are at the present time. The requirements are such that there is no man, however humble, who is unable to avail himself of these op-

portunities and privileges. In every community, this work is being conducted by the Y. M. C. A. and other organizations.

In many coal-mining districts, the larger companies have provided buildings, and teachers to give instruction to all employees who can be induced to attend; and mine officials, almost without exception, have shown deep interest in the work, realizing that the more intelligent their employees become, the more efficient results are produced by their labor.

NEED OF A LAW FIXING A STANDARD OF LEARNING AMONG ALIENS

It is a matter of regret that so large a portion of these alien employees look with suspicion on any effort put forth by the operators, thinking that their employer's chief object is to rob them. To overcome this difficulty it seems absolutely necessary that a law should be passed that would compel not only aliens, but also home-born adults to acquire a certain standard of learning and knowledge. The present state of Russia today is due to the illiteracy of its people, 90 per cent. of whom are said to be unable to read or write.

It is worthy of note, in this connection, that the Naturalization Court of Luzerne County, Penn., has decided that no applicant will be given his citizen papers before he can read and write the English language, or is making reasonable effort to acquire that ability. If the judges in other counties would take the same stand, it would go far toward inducing aliens to attend the night schools provided for their benefit.

The success and prosperity of every operation is largely measured by the standard of learning among its operatives. In order that everything shall work to the best advantage, each employee must be able to think and act for himself. Men that cannot read must depend on what is told them by those who can, and they naturally become the tools of their informants. It is safe to say that this condition is the primary cause of a majority of our strikes and disputes in mines and factories. A large portion of the workers are unable to read and think for themselves, and fall under the influence of agitators who can see but one side of the question.

Our thanks are due to Senator Hoke Smith for his efforts to wipe out illiteracy from the country. Twelve and a half million dollars spent annually for this purpose cannot fail to bring results in time. Money spent to uplift and educate citizens is money well invested, both from a humane and an economic standpoint. Let us do what we can to advance the cause.

West Pittston, Penn.

RICHARD BOWEN.

Certification and Safety

Letter No. 3—I wish to refer to the excellent letter of James Touhey, *Coal Age*, Feb. 20, p. 374, in which he has emphasized the need of arriving at a definite answer to the question of certification of mine officials, which was recently discussed by the Coal Mining Institute of America, in their meeting at Pittsburgh. It certainly is disappointing, to say the least, that no conclusion was reached in that discussion; but, on the contrary, there developed a wide diversity of opinion.

While it is possible that the discussion of the question in *Coal Age* will reveal some differences of opinion, I am sure that, in this as well as in other impor-

tant discussions relating to coal mining, facts and principles will be spoken that will be a benefit to the coal industry. The suggestions offered may not always prove alike applicable, but it still remains true that the difficulties of coal mining are brought more into subjection through the knowledge gained by discussion.

Referring to the question of the uncertification of mine officials, which was made legal by an enactment of the Pennsylvania Legislature, the action of the lawmakers seems to have been founded on the theory that a man, thoroughly tried in the mining game and found to be efficient and reliable, should be permitted to assume the duties and responsibilities of the office of mine foreman, whether or not he has been able to secure the certificate of the State Mining Board.

RESULTS REALIZED THE BEST GUIDE FOR THE FUTURE

In questioning the wisdom of this act, we must be guided by the results that follow in its wake. If the statement is true, as reported made at the Pittsburgh meeting, that "the employment of 28 uncertified men, in one inspection district alone, was largely responsible for the increase in the number of mine accidents in that district," it would seem to call for an investigation.

It seems incredible that any operator would continue to countenance incompetency on the part of a foreman in his employ; nor can we understand that the state would permit an attitude of neglect or indifference in respect to the safety of mine workers. While I believe that no operator would knowingly favor practices that are unsafe, it is frequently possible for such practices to be followed in a mine, before they are discovered by the higher officials.

A PLEA FOR SERVICE CERTIFICATION

Personally, I can conceive of no reason why there should be an uncertified official placed in charge of a mine; or, in other words, why a competent official should not possess a certificate, except by reason of illiteracy. However, if such a one has been able, by service, to prove his competency and responsibility, in the management of a mine, and has shown that he is thoroughly practical, though unable to pass the examination before the state board, it appears to me that there is no valid reason why an operator should not be permitted to place him in charge of the property in which the operator's capital is invested.

No one, it seems to me, will deny that it is better that such a man shall be given charge of a mine, than one who possesses a certificate but has little practical experience in underground work and conditions. It is my opinion, that the thoroughly practical man, though illiterate, should not be denied his place of service in a mine where the company or the operator has confidence in his ability to safely control the operations underground. There is no doubt that the repeal of the present revised law, in Pennsylvania, would eliminate a number of these men and prove a hardship to them.

WHERE A CERTIFICATE SHOULD BE DEMANDED

There is, however, another type of uncertified mine official. It is the man who might easily procure a certificate if he so desired. He has all the advantages of a common-school education and may have passed through the high school. His long experience as a competent mine foreman has, perhaps, given him a high regard for his own ability and inculcated in him a certain con-

tempt for the examination proceedings. This man will often excuse his neglect to enter the examination by stating that he has not the time or inclination to prepare himself for the technical work.

In my opinion, the type of man last mentioned should be legally bound to take the examination and should not be employed as mine foreman until he has secured a certificate. It may happen that the examination of this man, so high-minded in his own esteem, will prove that there are one or more points bearing on the welfare and safety of the men in respect to which his knowledge is deficient, which should cure the man of his egotism.

STATE LAW MUST REGARD PUBLIC WELFARE

Not to be misunderstood in regard to this important question, let me say that the state should compel compliance with any law intended for the general good of an industry. I will say that the fact that mine accidents increased in one district, owing to the employment of 28 uncertified men as foremen, should prove sufficient evidence that the repeal of the law that made such employment possible is the only remedy, unless it is shown that the incompetency of these uncertified men reflects on the mine inspectors of the district, who should then be held responsible for their lax interpretation of the law.

It may be that the examination for mine foremen and firebosses' certificates, in Pennsylvania, is a little stiff, in respect to the mathematical requirements. If so, it should be possible to modify the examination in such a way that illiterate or practical men will be able to prove their competency and secure a certificate. I feel that the law should protect the illiterate man who has qualified himself in a practical manner for holding the position of foreman in a mine. It may be that an oral, instead of a written examination, would be better adapted to determine the man's competency in such a case. It is my belief that practical men who can prove their qualifications for the position should receive the state's approval to act as foremen and firebosses in mines. This, however, is a question for the state.

Thomas, W. Va.

ESSEX.

Efficiency in Firebossing

Letter No. 12—There is much to be said in regard to securing the highest efficiency in a fireboss's work; it is a question of great importance and should be given careful consideration. However, few realize what an unpleasant and dangerous task a fireboss must perform, until they have had the actual experience themselves.

Where the territory to be examined is large a fireboss comes pretty near to having done a day's work when he has completed the morning examination of his district and has traveled the rough roads, climbed over falls and crawled through small openings on his hands and knees, all the time searching for the dangers that lurk on every hand.

THE FIREBOSSES' TIME IS NEVER HIS OWN

The duties of this position are such that a faithful fireboss can seldom call the time his own. His evenings are cut short, because he must go to bed at an early hour, so that he will be ready and fit for work when the time comes to enter the mine in the morning. Should he oversleep, his chances are slim for holding his job, as such neglect on his part would throw the mine idle for the day.

Mention has been made of mine foremen's proneness to look upon the fireboss as "a necessary evil." I must admit that this may be true in some parts of the country, and that the fireboss is not always given credit for the work he has to perform, in the same manner that a good coal hauler or a motorman receives credit for what he accomplishes. Such feelings toward a fireboss only exist where mine foremen and superintendents have never performed the same work themselves and do not realize the real nature of the task.

No superintendent or foreman who has climbed the ladder from firebossing in the mine to his present position fails to recognize that he is *not* securing the greatest efficiency in his fireboss by giving him such work as timbering or tracklaying. There should be, in every mine, sufficient work for a good fireboss to perform and keep him busy during a full shift without going outside of his own routine of business.

THE KIND OF WORK THAT SHOULD FALL TO THE LOT OF A COMPETENT FIREBOSS

In a newly developed mine, where there is not much area for a fireboss to cover, I should expect him to perform some other labor after he has completed his examination of the working places. But the kind of work that would naturally fall to him is bratticing, clearing gas from the working faces where it may have accumulated since he made his round in the morning, marking off cross-cuts in rooms and entries and similar tasks.

All matters pertaining to safety and first-aid work should be attended to by the fireboss. He should keep the fire extinguishers in good condition, see that the first-aid supplies are on hand and available for use when needed, and give any needed instructions to the men in their working places.

In concluding, let me suggest that those who would have firebosses do work of timbering, tracklaying, etc., set their alarm clocks and follow the fireboss, some morning when he makes his rounds in the mine. If they would do this for a few months, or even a few days, they would soon become aware of how the work tests a man's physical ability. They would know better, then, what the faithful fireboss undergoes, for which, too often, he receives little credit.

Poston, Ohio.

JAMES H. TAYLOR.

Letter No. 13—I too have had a few years' experience in the work of firebossing, and it has forced me to the conclusion that every mining company ought to give all the encouragement possible to this class of their employees. They should be given the incentive of promotion, and made to feel that this will be their lot as often as vacancies occur, providing that they prove to be faithful, sober and reliable men and are capable of filling a higher position.

Kindly permit me to refer to the letter of F. G. J., *Coal Age*, Dec. 19, p. 1133, and say that I fail to agree with his idea that the foreman who puts his fireboss to work digging coal and laying tracks or switches is not developing the highest efficiency of that official, in his own particular line. In another place, the same correspondent says that when a foreman does this he "is off the track, all wheels."

It is my opinion that the fireboss should not be set to work to dig coal; but if the mine is running short-handed any time, I think that a foreman is fully justified in giving his fireboss some work that will employ him during his full shift. I feel that a fireboss, under

such circumstances, should be willing to perform work that is important, after his examination of the mine is completed and, in answer to the question doubtfully asked, "Is the foreman doing his duty to the company or the fireboss?" I would say, Yes!

Let me suggest, here, How can a fireboss expect to become an efficient mine foreman if he does not know how to lay tracks, set timber and perform other work that is necessary to be done in the operation of a mine. In doing this, I do not think that a foreman is lowering the standard of firebossing. On the contrary, he is increasing the general efficiency of the mine by training the next man under him so that he will be able to perform his duties in his (the foreman's) absence from the mine.

THE TRAINING A GOOD FIREBOSS NEEDS

The fireboss who has had such training will be better prepared for promotion, because of his ability to perform other work than that in his own particular line of duties. It is important that he should know, from his own experience, how long a time is required for a man to lay a switch, set a timber, or do any other work that may be required of him.

In my own experience of six years of firebossing, let me say that when I had completed my morning inspection I have often acted as roperider, mule driver, track-layer, machine runner and timberman. But, in all that time, I have never been asked by my foreman to do anything contrary to the state law. Had he made such a request, my answer would have been, "No, I would rather give up my place than to be unjust in my duty to the state and to the miners in my charge." I want to add that, in my opinion, every mine foreman should have come into his position only after five years of practical experience underground and by the fireboss route.

Carbon County, Utah.

Lubricating Mine Cars

Letter No. 1—In response to the request for an expression of opinion, from mining men, as to the cost of lubricating mine cars equipped with the average type of plain-bearing wheels, a comparative reference being made to the cost when cars are equipped with roller bearings, I am pleased to submit the following data, hoping to let light in on a subject that has frequently been in dispute:

We operate a drift mine and have in use 420 mine cars equipped with plain bearings. These cars will average 12 mi., each, per day. Our records show that we purchased, during 1918, 6204 gal. of blackstrap oil. Of this amount 1034 gal. were used on the mining machines, which supply was kept at a point nearly a mile from our mine-car oiling station. This fact precludes the idea that any of the oil supply for mining machines could, by any mischance, be included in that used on the mine cars. The balance of oil used for lubricating the cars was $6204 - 1034 = 5170$ gal. Our oil contract, for 1918, was 11.5c. per gal. The average cost of lubricating each car, for that year, therefore, was $(5170 \div 420) \times 0.115 = \1.415 .

During the year 1918 we worked a total of 240 days, and paid our oiler \$4.18 per day, which made a total of \$1003.20, and the cost of labor for oiling each car was $1003.20 \div 420 = \$2.389$ per year, which, added to

the cost of the oil, gives $1.415 + 2.389 = \$3.804$ per car, per year.

Now, for the sake of comparison, let me assume that our cars were equipped with flexible roller bearings, instead of plain bearings. In that case, the cost would have been about as follows: I will take the figures quoted by "Observer," in the inquiry to which I have referred, and assume 16 lb. of grease to be required, per car, per year. The market quotation for flexible-bearing grease, in this vicinity, is 17c. per lb. and not 10c., as stated by "Observer." This would make the cost for grease $16 \times 0.17 = \$2.72$, per car, per year.

GREASING VS. OILING MINE CARS

It takes much longer to grease cars than to oil them, and "Observer's" estimate of 40 days, for greasing the cars, is probably correct. We pay for this work \$4.18 a day, which would make the cost of greasing 420 cars, $40 \times 4.18 = \$167.20$, per year, or $167.20 \div 420 = \$0.398$, per car, per year. The total cost for grease and labor is, therefore, $2.72 + 0.398 = \$3.118$, per car, per year.

Now, the apparent saving by greasing, instead of oiling the cars, is $3.804 - 3.118 = \$0.686$ per car, per year. In our case, the saving for greasing 420 cars would be $420 \times 0.686 = \$288.12$, per year. Comparing this small saving with "Observer's" estimated saving of \$6530, per year, for greasing 500 cars, I might ask, in the language of the street, "Where does he get that stuff?"

VIEW OF A PREJUDICED SALESMAN

Quite recently, a demonstrator who represented one of the largest grease companies in the United States called at my office on business. While we were conversing, the mail was brought in, and the issue of *Coal Age*, for February 20, was laid on my desk. I am always especially interested in the *Coal Age* discussions, and my eyes quickly caught this inquiry of "Observer," to which I have referred.

After a cursory glance through the article, I handed it to my visitor and asked for his opinion, it being in his direct line. Taking a few moments to glance through the article, he replied, "Obviously inspired." Such also is my opinion. My visitor was especially interested in the price of 10c. for grease, and informed me that flexible-bearing grease was then selling for 17c., with a possibility of its going higher in a few days.

I frankly admit that our cost of lubrication is low, as compared with many mines that I have visited. However, we hire a competent man and give him the best oil we can buy. He has other duties to perform besides oiling the cars. We have very few complaints from drivers and other men, in regard to stiff running cars, although we occasionally find a dry wheel.

Our practice of oiling cars in broad daylight is a distinct advantage over the practice of performing this work in the dim light of a shaft bottom. I too have seen mines where much oil is wasted; but, in every case, the oiling was being done by a young irresponsible boy. In a mine where haulage is performed over a good track and roadbed, and the rolling stock is kept in good condition, there is little cause for low production owing to delays on the road. Let me close with the remark that it would be interesting to get actual figures on the cost of lubricating flexible-bearing mine cars.

J. S. GELSTON, Supt.,

Noblestown, Penn.

Fayette Coal Co.

INQUIRIES OF GENERAL INTEREST

EDITED BY JAMES T. BEARD

Surveying in an Inclined Seam

I beg to submit the following question for solution in *Coal Age*. As it is worded it is difficult to understand:

A vein dips 60 deg. to the south and strikes N 70° E. Consider the outcrop of the vein as having an elevation of 3650 ft. At a distance of 500 ft. from the outcrop, a vertical shaft is sunk to intersect the vein, the elevation of the surface at this point being 3601. From this shaft, the mouth of a crosscut tunnel bears S 60° E, 2000 ft., on a vertical angle of -30 deg. This tunnel is driven N 33° W, on a 2 per cent. grade, to intersect the vein. It is required, now, to find the length of a slope driven on the vein, from the foot of the shaft to the head of the tunnel.

STUDENT.

Shamokin, Penn.

We believe the accompanying sketch, which approaches an isometric perspective, will make the probable meaning of this question clear. Assume two verti-

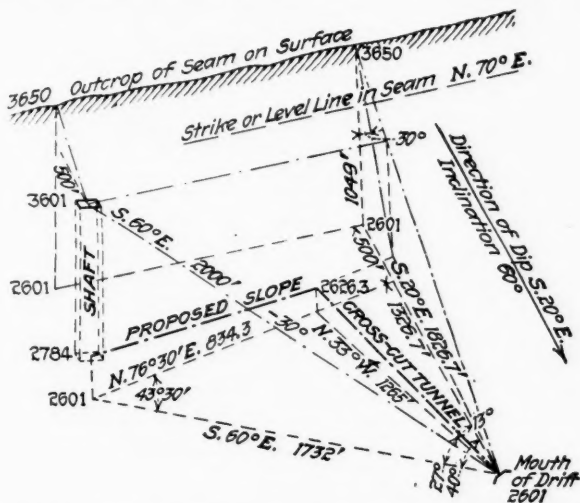


DIAGRAM OF OUTCROP, SHAFT, TUNNEL AND SLOPE

cal planes, as indicated by the fine dotted lines in the figure, are passed through the outcrop and the shaft, respectively, and parallel to the strike of the seam, which is N 70° E. This seam dips to the south and the direction of the dip, which is at right angles to the strike, is therefore S 20° E. The inclination of the seam is given as 60 deg.

In the space at our disposal, it is only possible to give, in their order and briefly, the successive steps in this problem. The first step is the calculation of the horizontal triangle underlying the crosscut tunnel, the proposed slope and the line joining the top of the shaft with the mouth of the drift. All that is known in this triangle is the direction of two of its sides, as given by the bearing of the mouth of the crosscut tunnel from the shaft, S 60° E, and the direction of the crosscut tunnel itself, N 33° W, respectively. The difference between these two bearings is 60 - 33 = 27 deg., which is therefore the angle included between the two

sides of the triangle mentioned. It is necessary, now, to calculate the lengths of these two sides. The first side is the horizontal projection of the line joining the top of the shaft and the mouth of the tunnel and its length is found as follows:

From the reading of the question, the 2000 ft., from the top of the shaft to the mouth of the drift, is to be taken as pitch measurement, on an inclination of -30 deg. This corresponds to a horizontal measurement of $2000 \times \cos 30 \text{ deg.}$, or $2000 \times 0.866 = 1732 \text{ ft.}$ Likewise, the mouth of the drift is $2000 \times \sin 30 \text{ deg.}$, or $2000 \times 0.5 = 1000 \text{ ft.}$ below the top of the shaft, making its elevation 2601.

The second side of the triangle is the horizontal projection of the crosscut tunnel. In order to calculate its length, assume a vertical plane is passed through the mouth of the drift and parallel to the full dip of the seam. Projecting the line S 60° E, 1732 ft. onto this vertical plane gives, for its corresponding length, $1732 \times \cos 40 \text{ deg.}$, or $1732 \times 0.766 = 1326.7 \text{ ft.}$ Adding to this the distance from the outcrop to the shaft, 500 ft., gives 1826.7 ft. for the horizontal distance the mouth of the drift is from the outcrop. The vertical height of the outcrop above the drift mouth is $3650 - 2601 = 1049 \text{ ft.}$

Now, in order to determine the point where the crosscut tunnel intersects the seam, it is necessary to project the line of the tunnel on the vertical plane passing through the mouth of the drift and parallel to the full dip of the seam. This projected line will have a slightly greater grade than that of the tunnel. The increased grade is found by dividing the grade of 2 per cent. by the cosine of the angle between the cross-tunnel and the plane of projection, which is 13 deg. Thus, $0.02 \div 0.974 = 0.0205$, which is the tangent of the grade angle of the projected line. Then, calling the rise of this projected line at the point where it intersects the seam x , we have

$$\frac{x}{0.0205} + (1049 - x) \tan 30^\circ = 1826.7$$

$$x = 25.3 \text{ ft.}$$

The elevation at the head of the crosscut tunnel is, therefore, $2601 + 25.3 = 2626.3 \text{ ft.}$ Now, dividing the given rise, by the percentage of grade of the tunnel gives, for the horizontal length of the tunnel, $25.3 \div 0.02 = 1265 \text{ feet.}$

In the horizontal triangle previously mentioned, there are now known two sides and their included angle. The lengths of these sides are 1732 and 1265 ft., respectively, and the included angle is 27 deg. Then, calling the angle that the proposed slope makes with the line joining the foot of the shaft and the mouth of the drift A , it is found thus

$$\tan A = \frac{1265 \sin 27^\circ}{1732 - 1265 \cos 27^\circ} = \frac{1265 \times 0.454}{1732 - 1265 \times 0.891} = 0.949$$

The angle A is, therefore, $43^\circ 30'$, which makes the bearing of the proposed slope N $76^\circ 30' \text{ E.}$ The horizontal length of this slope is $1265 \times \sin 27 \text{ deg.} \div \sin 43^\circ 30' = (1265 \times 0.454) \div 0.688 = 834.3 \text{ ft.}$

EXAMINATION QUESTIONS

ANSWERED BY JAMES T. BEARD

Hoisting Engineers' Examination, Springfield, Ill., Dec. 18, 1918

(Selected Questions)

Ques.—What is the breaking strain and safe working load for a good steel hoisting rope $1\frac{1}{4}$ in. in diameter?

Ans.—The breaking strain of a crucible, cast-steel, 6-strand, 19-wire, hoisting rope, 1 in. in diameter, is 39 tons. Then, since the strength of wire rope varies approximately as the square of the diameter of the rope, the breaking strain of this rope, $1\frac{1}{4}$ in. in diameter, is

$$S = 39d^2 = 39(1\frac{1}{4})^2 = 60.9 \text{ tons}$$

For a moderate depth of shaft, say not exceeding 100 yd., the working load on this rope would be taken, commonly as one-fifth of the breaking strain, or in this case, say 12 tons. In deeper shafts and where a high speed of hoisting is employed the safe working load may be estimated as one-eighth or even one-tenth of the breaking strain of the rope.

Ques.—(a) What is steam and how is it produced? (b) What is meant by high-pressure and what by low-pressure steam?

Ans.—(a) Steam is the vapor that is produced when the temperature of water is raised above its boiling point, for any given pressure. In steam-engineering practice, steam is produced by the evaporation of water in a boiler constructed for that purpose and provided with a furnace for heating the boiler.

(b) This question cannot be answered intelligently without knowing its application. In steam-heating practice, "low-pressure steam," is generally understood to refer to a steam pressure not exceeding 15 lb. gage. On the other hand, in steam-engine practice, the terms "low pressure" and "high pressure" applied to steam have a purely local designation or meaning. What would be low pressure, in the operation of some types of engines, would be high pressure for engines of another type. In ordinary hoisting practice, where steam engines are employed, the term "low-pressure steam" may be taken, generally, as steam pressure not exceeding 150 lb. gage, and higher pressures than this might be termed "high-pressure steam;" but there is no actual line of demarkation in engine practice.

Ques.—Define a unit of heat.

Ans.—A unit of heat is the quantity of heat required to raise a unit weight of pure water, at its maximum density, 1 deg., in temperature. There are several heat units in common use, depending on the denomination of the unit of weight and the scale of temperature used. For example, the British thermal unit (B.t.u.) is the quantity of heat required to raise the temperature of 1 lb. of water 1 deg. of the Fahrenheit scale. The French unit is the quantity of heat required to raise the temperature of 1 kg. of water 1 deg. of the Centigrade scale. This unit is called a "calorie." Another unit, sometimes used, combines the two units just given and is called the "pound-calorie." It is the quantity of heat required to raise 1 lb. of water 1 deg.

of the Centigrade scale. In each case, the water is pure distilled water, at its maximum density (4 deg. Centigrade).

Ques.—What is meant by water line, steam space, and heating surface of a boiler?

Ans.—The water line of a boiler is the mean water level, which is midway between the lower and upper try-cocks of the water column of the boiler.

The steam space of a boiler is all the space above the water line.

The heating surface is the entire surface of the boiler and tubes or flues that is exposed to the hot gases and flame of the furnace.

Ques.—(a) Define the terms "natural draft" and "forced draft." (b) How is the latter produced?

Ans.—(a) Natural draft, in boiler practice, is the ordinary draft produced by the column of heated gases ascending the stack. A forced draft is that produced by a fan or blower.

(b) Mechanical draft is produced in two ways: What is commonly called "forced draft" is caused by blowing air into the ashpit, which is closed, whereby the air is forced up through the fire. An "induced draft" is often produced by a steam jet or exhaust fan in the flue leading to the stack. By this means, air is drawn through the fire and the draft increased. Both of these forms of artificial draft are often styled "forced draft."

Ques.—What thickness of steel plate is required in the shell of a cylindrical boiler 60 in. in diameter, for a safe working pressure of 100 lb. per sq.in., the tensile strain on the boiler plates not to exceed 8000 lb. per sq.in., and no allowance to be made for joints?

Ans.—Let p = safe-working steam pressure (lb. per sq.in.); d = diameter of boiler shell (in.); t = thickness of metal in the shell (in.); S = allowable stress in the steel plates forming the shell (lb. per sq.in.) Then, the required thickness of the shell in the cylindrical boiler is calculated thus:

$$t = \frac{pd}{2S} = \frac{100 \times 60}{2 \times 8000} = \frac{3}{2} \text{ in.}$$

Ques.—What pipe fittings, valves and other attachments are used in setting up and connecting a boiler and engine?

Ans.—First, the feed pipe, with its check valve and two stop valves, connecting the feedpump with the boiler. Second, the steam pipe leading from the boiler to the engine, with its globe valve and non-return stop valve. Third, the blowoff pipes, including both the surface blowoff and that from the mud drum with their valves. The attachments that come with every boiler are the water column, with its try-cocks and gage for ascertaining the water level in the boiler; fusible plugs for guarding against the danger of low water in the boiler; the safety valve for relief of any excess boiler pressure. To these attachments will generally be added the feed-water heater and a steam separator for separating the steam from its entrained water, together with a steam trap for draining off the water that collects in the pipe system.

FOREIGN MARKETS AND EXPORT NEWS

EDITED BY ALEX MOSS

American vs. English Coal Output and Prices

A situation of extraordinary gravity has developed in England in relation to coal. Unless it is corrected, and at present this appears to be a thing of great difficulty, the British are certain to labor under heavy handicap in manufacturing and in world trade.

Coal sells today in Birmingham, Manchester, Bradford and other big industrial centers at \$10 a ton wholesale. That means a long ton of 2240 pounds. The cost of coal at the mouth of the mine has been climbing steadily. In 1913 it was \$2.18 a ton. In 1915, \$3.11; in 1917, \$4.17; in 1918, \$6.20. Now the miners demand a six-hour workday and an increase in wages. If they get them it is estimated the cost of coal at the mine mouth will average \$8.25 a ton.

It must be understood British coal is bituminous. It must be understood also that one-third of all the coal mined in England and Wales has been exported, going to Italy, Spain, Norway, Sweden, Africa, South America and to the innumerable coaling stations mentioned along the lanes of the seven seas.

Pocahontas coal, one of the highest grades of bituminous in America, sells at \$2.75 a ton at the mines. This is 40 cents a ton higher than the last price set by the fuel administration. Compare that with the British price and you will appreciate the plight of the British coal producer.

British trade has been buttressed by British control of coal. Thousands of ships went out from British ports with coal and came back with freight—raw material, usually, for British manufacturing establishments to turn into finished goods. Cargo each way lessened the freight rates.

Return Cargoes a Stumbling Block

One of the difficulties America labored under in endeavoring to build up a foreign trade has been that usually it was not able to provide freight both ways.

Now it appears as if America is going to win from Great Britain a considerable percentage of the coal trade of the seas. Great Britain's exports normally have been 80,000,000 tons a year. Today America can deliver coal in South America, Spain, Africa or the Mediterranean cheaper than the British.

Appreciating what this portends, the British Government has taken radical action. It has made a thorough investigation of the coal situation. It has discovered that while the price of coal has been vaulting to heights never reached before in England, production has been decreasing not only in gross quantity, but in tons per man employed. From 274,000,000 in 1913 the yield in 1918 in Great Britain dropped to 218,000,000. Nearly 1,000,000 men are employed in coal mining in the British Isles. In America the production has been increasing enormously until now the gross output is more than three times that of Great Britain. But that is only part of the story. The American coal miner produces three times as much coal per day as the British miner.

The investigation of the British Government shows that mine owners have taken advantage of the public in the war period. Their net profits in 1914 on a production of 266,000,000 tons was \$75,000,000. In 1918 on a production of 128,000,000 tons it was \$195,000,000.

It practically is certain the Government will take over the British coal mines, close all those where the production costs are excessive and do everything possible to increase production in mines where the costs are moderate comparatively.

This will help, but not enough. The chief difficulty is basic. The British mine is not equipped for economical working as is the American mine, and the British miner is not comparable to the American miner in ability.

Nothing that has come out of the war is likely to play a larger part in promoting America's foreign commerce than this revolution in the coal situation.

America's coal exports have been small. They are likely, as soon as sufficient ton-

Exports of Coal and Coke During February, 1919

Districts	Anthracite, Tons	Bituminous, Tons	Coke, Tons
Maine and New Hampshire.....	7	3,573	39
Vermont.....	574	987	29
Massachusetts.....	250	1,035	.....
St. Lawrence.....	56,127	89,288	3,221
Rochester.....	8,069	45,881	790
Buffalo.....	145,644	129,956	13,332
New York.....	615	3,561	1,586
Philadelphia.....	9,503	21,468	.....
Maryland.....	.....	31,858	3,777
Virginia.....	.....	194,814	920
South Carolina.....	.....	3,960	.....
Georgia.....	.....	1,466	.....
Florida.....	.....	2,024	.....
Mobile.....	.....	44	.....
New Orleans.....	.....	2,025	14
San Antonio.....	127	1,817	2,587
El Paso.....	25	2,018	933
Arizona.....	.....	1,294	9,367
Southern California.....	.....	13	.....
San Francisco.....	.....	.....	32
Washington.....	4	354	297
Dakota.....	73	402	151
Duluth and Superior.....	.....	1,552	27
Michigan.....	.....	128,364	7,390
Ohio.....	.....	46,037	4,314
Porto Rico.....	.....	160	.....
Total.....	221,018	713,951	48,806

Countries:

France.....	.....	.....	1,311
Italy.....	.....	4,933	.....
Netherlands.....	.....	15,076	.....
Turkey in Europe.....	201	200	.....
British Honduras.....	.....	45	.....
Canada.....	210,721	446,429	29,490
Costa Rica.....	.....	50	40
Guatemala.....	.....	750	3
Honduras.....	.....	224	10
Nicaragua.....	.....	8,661	13
Panama.....	.....	.....	.....
Salvador.....	.....	152	13,589
Mexico.....	.....	.....	.....
Newfoundland and Labrador.....	250	.....	.....
Barbados.....	40	10,692	.....
Trinidad and Tobago.....	.....	3,064	.....
Other British West Indies.....	50	.....	.....
Cuba.....	9,503	40,644	.....
Virgin Islands.....	.....	469	.....
French West Indies.....	.....	1,641	2
Dominican Republic.....	.....	1,099	.....
Argentina.....	.....	38,993	218
Brazil.....	.....	67,825	190
Chile.....	.....	49,056	.....
Colombia.....	.....	1,371	.....
Peru.....	.....	5,580	3,913
Uruguay.....	.....	12,007	.....
Venezuela.....	.....	.....	20
Turkey in Asia.....	101	.....	.....
Total.....	221,018	713,951	48,806

BUNKER COAL

Maryland.....	21,819
New York.....	209,619
Philadelphia.....	23,819
Virginia.....	69,845

nage is available, to reach to tens of millions of tons a year. That will mean much in lessening the ocean freights and drawing raw materials to America for manufacture. The largest single item, however, will be in making it possible for American industrial establishments, through comparatively cheaper fuel, to meet foreign competition in all the broad markets of the world.

The Department of Mines of Australia has been investigating the coal deposits at Leigh Creek in the hope of finding coal suitable for commercial uses, but so far has not met with success. A method is now being sought whereby the low-grade coal found in Southern Australia can be utilized, as all coal used there at present is shipped from Newcastle, England, and the lack of ships is making it difficult to procure ample supplies.

Low Prices Will Help American Coal Exporters

For a number of years before the war the output of coal in the United States was substantially increasing, per unit of labor, while in England the tendency was in the opposite direction. Also, the costs of production in Great Britain were higher than those in the United States. But by reason of geographical and other advantages England kept a long lead in the export of coal.

The demands of the British miners and the continued diminishment in the output of Great Britain's coal mines have made it possible for the United States to enter foreign markets where England had formerly reigned supreme, says an article in a recent issue of the *Philadelphia Public Ledger*. And in this connection it may not be inappropriate to call to attention certain interesting investigations into the general problem of international fuel prices conducted on behalf of the United States Government before the war.

These investigations related, primarily, to the possibility of diverting trade from the old Suez Canal route to the new Panama route by means of cheap coal. When competition between the Suez and Panama routes, and between American and British industries comes into full play, the price of coal will be a dominating factor. In many cases where the distances between western European and eastern American and Canadian ports, on the one hand, and those of the Orient, Australia, New Zealand and South America, on the other, are anything like equal by the rival routes, coal prices will decide which way the vessels will go; and, of course, whether they use British or American coal on their voyages. If coal prices are much lower at stations on the Panama route than at those on the Suez route, the new waterway will attract the most trade and British interests will suffer to that extent.

Government Started Investigation

Our Government recognized the importance of this coal price question as soon as it was seen that there was a good prospect of the Panama Canal being opened to traffic. Experts were set to work on an elaborate investigation. Various classes of coal were tested for their steaming values, their prices at different coaling stations compared, and estimates as to the price at which American coal might be supplied to vessels using the Panama Canal were prepared.

It was laid down that cheap coal would do as much as low tolls to attract traffic to the new canal and build up the industries of the countries whose trade would be tributary to the canal. It was pointed out that the Government would have to maintain coaling stations at the canal to supply the navy, and that the sale of coal to merchant vessels would simply require larger storage. Further, it was insisted that coal should be supplied at or near bare cost. Since then the Government has established huge coaling stations at both ends of the canal, and it has been decided to increase greatly the coaling accommodation at several ports on the Panama route.

It was established as a result of the investigation that New River coal was only 5 per cent. inferior to best Welsh coal in steaming quality, and from a long list of prices given in a Government publication it appeared that even then, before the Government had got its scheme launched, New River coal was being supplied to ships at St. Lucia, Windward Islands, at about \$5.50 a ton, while Welsh coal was about \$6 at Port Said. It was stated that while Welsh coal was in the neighborhood of \$5.75 at Southampton, Morristdale coal was only \$3 at New York.

It was pointed out that the coaling stations along the Suez route obtained their coal mainly from Wales, England and Scotland, and that the prices varied from 21s. for Durham to 26s. for Welsh at Port Said, whereas it was anticipated that New River coal could be supplied at Colon, or Cristobal, Panama, at least as low as \$4.43 by

the time the canal was opened and as low as \$3.96 eventually. When the war broke out the Panama Railroad Co. was getting its coal for \$2.70 Norfolk, plus \$1.39 for transportation to Colon.

By way of illustration, a steamer of 4640 tons gross, making a round voyage of ten knots from New York to Manila by way of Suez, coaling at the usual stations, costing \$20,868, was assumed to have made the trip via Panama, coaling at New York, Newport News, Colon, San Francisco, Japanese ports, Moji, San Francisco again, and Colon, and the cost was figured at \$18,222—a saving of \$2646. The saving was found to be due to the lower prices at Panama than in the Mediterranean and at Japanese ports than at Sebang.

Another Coal Field Dispute in Europe

The coal fields of the Teschen district, in dispute between the Czecho-Slovakia and Poland, present one of the most difficult problems before the peace conference. Both nationalities claim the district is essential to their development. Of the total population of 600,000 about one-third are Czecho-Slovaks and the rest Poles, but if the district were divided on racial lines the industrial district and the railways would be split so as to be of little value to either country.

The Teschen mines are declared to provide the only coking coal available for Czecho-Slovakia and consequently her industries cannot live without them. Warsaw is supplied with gas from the Teschen fields and is dependent upon them for the light, heat and power for the city. Poland, it is stated, has other coking coal fields, but has not developed them.

The Peace Conference Commission on Polish Affairs and the Inter-Allied Commission sent to Poland have been working hard in an endeavor to arrange some plan which will make the Teschen coal available for both countries.

Swiss to Get Saar Coal

The Swiss Federal Council has ratified the economic agreement made with France in Paris, on March 25. Under this agreement, the French government will undertake to deliver to Switzerland each month 60,000 tons of coal from the Saar mines situated on Lorraine territory. The convention stipulates that the French government will assure Switzerland of a supply of steel, to the best of its ability. In return Switzerland shall export to France 25,000 head of cattle, of which 15,000 are to be delivered immediately and the remainder during the present year. The convention will be valid until Dec. 31, 1919.

Poland's Coal Deposits

One of Poland's greatest needs is the modern development and full exploitation of its coal mines, says George Fudakowski, manager of the Commercial and Industrial Bureau of the Polish National Department, at New York.

Poland's coal fields occupy an area of 2048 square miles and are situated in Dombrowa, Cracow and the Silesian Basin. The deposits in this area are estimated at 94.33 billion tons, of which 61 per cent. is in Upper Silesia; 34 per cent. in Galicia and Austrian Silesia, and 5 per cent. in former Russian Poland. The coal is of good quality, produces little ash, but only the coal of Upper and Austrian Silesia can be transformed into coke. The beds are of considerable thickness and are generally found not far from the surface.

In 1911 the coal produced from these three sources amounted to over 52,000,000 tons, exceeding the annual production of France, which was estimated in 1910 at 41,000,000 metric tons, and represents one-third of the production of coal in Germany without Upper Silesia, the total production of Germany in 1913 being 191,500,000 metric tons.

Mr. Fudakowski says that it is the purpose of the Bureau to present to American investors the development of electrical power in the Polish Silesian coal districts, transmitting it to the main industrial centers in the vicinity of Lodz and Warsaw, a carrying distance of between 120 and 180 miles. This, he says, will permit not only the control of electric power distribution in the mining district, with its numerous industrial establishments, but it will also permit supplying other industrial and agricultural establishments throughout the country.

Foreign Coal Trade Opportunities

A firm in Spain desires to get in touch with shippers of gas and steam coal for that market. Quotations should be given f.o.b. port of departure. Reference. Address Bureau of Foreign and Domestic Commerce, Washington, D. C., or any of its branches, and refer to Opportunity No. 29043.

A wholesale coal dealer in Sweden wishes to purchase steam coal for use in smithys, gas, and for briquets, etc. Quotations should be given f.o.b. Cash will be paid. Reference. Address Bureau of Foreign and Domestic Commerce, Washington, D. C., or any of its branches, and refer to Opportunity No. 29044.

Italians in Straits for Coal

Italian public opinion is very much aroused by the apparent indifference of other countries toward the great crisis that Italy is facing. The coal situation is most serious and unless immediate relief is obtained many of the largest industries will be obliged to suspend activity. The attempt to increase the limited English supply sent to Italy with supplies for various other countries has failed. France has promised to ship 80,000 tons of coal monthly, amounting to about one-tenth of the minimum requirements of Italy. America could furnish the difference, but there is not the necessary tonnage available. Transportation from Germany is also difficult.

Will Take Years To Rehabilitate Pas de Calais Mines

While the securing of coal from the Saar valley will permit some activity in the iron industry in Alsace-Lorraine, Westphalian coal must be had if the industry is to be brought to full efficiency. This is the opinion of Frank H. Probert, the dean of the College of Mining of the University of California, who just has returned from a visit to Europe. Professor Probert, who is consulting engineer of the Bureau of Mines, visited the mining areas in the devastated regions as a member of the Bureau of Mines committee, which is studying the problems presented in the rehabilitation of mines there.

The physical damage done to the iron mines in Alsace and Lorraine, says Professor Probert, was not great. The principal damage has been caused by the pursuit of ore extraction without thought of the permanency of the work or advance development. Much time will be required to replace the steel plants. Most of the magnificent plants in this area were subjected to scientifically conducted destruction. Ample proof of the wilful nature of this destruction is in the possession of the allied military authorities.

Such plants as are left must depend on German coal. Professor Probert is hopeful that an arrangement can be made which will permit of the importation of Westphalian coal for these plants. The absolute destruction of the coal mines in the Pas de Calais section makes it necessary to use either the Westphalia or the coal from the Saar valley. The Saar mines, however, produce a poor quality of coking coal. It will not be possible to operate blast furnaces efficiently unless provision is made for the introduction of better coal.

It will be five years, in the opinion of Professor Probert, before it will be possible to dewater and to reopen the mines in the Pas de Calais section. It will be ten to fifteen years, according to his prediction, before they can be brought back to pre-war production. The flooding of the eastern end of the district offers the greatest problem in reclaiming these mines. It will be necessary to remove some 25,000,000 cubic meters of water. While it is not known how much quicksand has come into the mine, Professor Probert believes that it will be possible to reclaim most of the old shafts and laterals.

Prepayment of Charges on Slack Coal Consigned to Canada

Effective Apr. 15, 1919, Canadian railroads will include in their coal tariffs from frontier points to Canadian destinations the following statement: Freight or other charges will not be advanced on shipments of bituminous slack coal from United States points. All charges through to destination must be prepaid or guaranteed.

1. The New York Central R.R. will not itself guarantee to the Canadian lines collection of charges either to or beyond the frontier on bituminous slack coal.

2. Charges must be prepaid through to destination or satisfactorily guaranteed by shippers and prepayment or guarantee will be passed to Canadian carriers by the New York Central R.R.

3. Reconsignments of bituminous slack coal from original destinations in the United States to destinations in Canada, or from one Canadian destination to another to which the rate from the mines is higher, will not be performed by the New York Central R.R. unless the party requesting such reconsignment prepaies or makes satisfactory guarantee of all freight or other charges through to such Canadian destinations.

4. When charges are guaranteed, a statement to that effect must be shown on or accompany the original waybills.

Our Coal Wanted by Swiss

The New York *Tribune* reports: "Charles A. Anderson & Co. have received cable requests to buy up a large tonnage of coal for Swiss consumers. This is said to be the first time that country has sought to buy coal in the American market, as her logical sources of supply are, under ordinary circumstances, Germany, France or England. The labor troubles in England as well as in Germany, and the wrecking of the French mines in the Lens region during the war, are said to have forced the Swiss to seek fuel supplies in this country. The coal will be forwarded as soon as arrangements can be made for transportation.

An order for 25,000 tons of coal for export delivery has been placed in the Fairmont region of West Virginia. This coal will be shipped to a neutral European country by way of Curtis Bay and is regarded as the beginning of the export movement. One of the large companies in Harrison County started to get out this coal on Tuesday, Apr. 8.

There will be no import duties on coal or siderurgical material into Italy until May 1, according to a cablegram received by the Bureau of Foreign and Domestic Commerce of the Department of Commerce. On account of the coal shortage the consumption of gas has been restricted to certain hours each day. The Commissioner of Fuel stated, in an interview, that the fuel products of the country could be developed to meet its requirements. He also stated that he was in a position to supply 800,000 tons of lignite for railway industrial purposes.

Hampton Roads Coal Exports

NORFOLK

		Cargo	Bunkers
Lamberts Point			
Mar. 9	Amer. S.S. Lake Markham.....	2380	349
Mar. 9	Amer. S.S. Lake Grati.....	3463	468
Mar. 9	Amer. S.S. American.....	7101	1496
Mar. 9	Amer. S.S. Calispell.....	2995	216
Mar. 10	Ital. S.S. Alcazar.....	4082	479
Mar. 11	Br. S.S. Benedict.....	1887	853
Sewalls Point			
Mar. 8	Nor. S.S. Ryvarden.....	1522	199
Mar. 8	Am. Sch. F. H. Odiorne.....	381	....
Mar. 10	Amer. S.S. Lake Yahara.....	2586	850
Newport News			
Mar. 2	Am. Sch. General Pershing.....	2466	....
Mar. 5	Amer. S.S. Lake Fluvanna.....	2983	378
Mar. 8	Amer. S.S. Lake Chelan.....	2030	122
Mar. 9	Am. Sch. Irene S. Wilkinson.....	1150	....
	Havana, Cuba.....		
	Barbados, B. W. I.....		
	Rio de Janeiro, Brazil.....		
	San Juan, P. R.....		
	Gibraltar FO (Italy).....		
	Para, Brazil.....		
	Kingston, Jamaica.....		
	Hamilton, Bermuda.....		
	La Plata, A. R.....		
	Rio de Janeiro, Brazil.....		
	Fort de France, Martinique.....		
	Cienfuegos, Cuba.....		
	Rio de Janeiro, Brazil.....		

COAL AND COKE NEWS

EDITED BY ALEX MOSS

What Happened in March

[The bracketed figures in the text refer to pages in the present volume and should the reader desire further information he can obtain it by reference to the pages indicated.]

Mar. 3—Senator Vardaman declares that high prices of anthracite during the war were the outcome of monopoly, and that royalties in the anthracite region are too high [XV, 451, 496, 497].—Governors of states and mayors of cities meet in conference at the White House, Washington, D. C., with members of Cabinet and others. They discuss means of reviving business.

Mar. 4—About 16,000 harbor workers in New York harbor go on strike against Macy award of 12-hours' pay for 8 hours of labor and other concessions. They demand an increase of 30 per cent. in the wage rate also.—A. L. Dickenson, financial advisor to the Coal Controller of Great Britain, announces that for the first 8 months of 1918 the profit on mining in that country averaged 86c. per ton on coal having an average cost of \$6.05, which is 14.2 per cent. profit per ton. This is over three times average profit in the 5 years ending 1913, when the profit was 24.3c. per ton and the price at the pithead \$2.13. Some companies in 1918 were making \$1.46 per ton.—S. D. Warriner makes reply to the Mar. 3 statements of Senator Vardaman [XV, 491].

Mar. 5—Ten men almost overcome fighting "Jersey mine fire" at Chauncy Colliery of George F. Lee Coal Co. [XV, 510].—Governors and Mayors' conference adjourns sine die after recommending Government activity in railroad construction, the ascertainment by Government of fair prices for staples, opposing price fixing, urging further reductions in freight rates for building materials, opposing reductions in wages till prices fall, asking Federal Government to use its influence in favor of higher street-car fares, impressing on Government need for speed in making war contract settlements and announcing its policy as to excess material on hand, recommending inquiries into wastes of natural resources, calling for continuance of public employment agencies, urging the mustering out of soldiers at point of enlistment, advocating suitable memorials to the heroic dead and recommending that the controllers of natural resources who withhold them for speculative profit or visionary future development be compelled to release them.

Mar. 11—Charles P. Neill gives decision in favor of the crane men, engineers and firemen engaged in steam-shovel work at the Jeddo stripping of G. B. Markle Co. [XV, 541].

Mar. 13—Governor W. C. Sproul of Pennsylvania announces that he has asked Attorney-General W. I. Schaffer what powers are vested in the State Government to inquire into the rise in the cost of anthracite [XV, 553].—Mine workers protest against the Girard royalties as excessively large and as operating to close such mines as have to pay them [XV, 542].

Mar. 18—Policy Committee of United Mine Workers of America advocates 6-hour day, 5-day week, substantial increase on tonnage, daywork, yardage and dead-work prices with Government ownership [XV, 541, 583].

Mar. 19—Fuel Administration urges the buying and stocking of coal to avert coal famine next winter [XV, 579].—Dr. H. A. Garfield desires the National Coal Association to submit in a referendum to all its members a plan of governmental co-operation [XV, 580].—Thirteen United Mine Workers' leaders are indicted for being parties to a shooting at the mines of the E. E. White Coal Co. in November, 1917, the Raleigh, W. Va., grand jury returning a true bill [XV, 630].—Mine workers in Essen region, Germany, adopt resolution in favor of 7½-hour day, to be reduced later to 6½ hours [XV, 630].

Mar. 20—Sankey Commission makes interim report on the wage question in Great Britain advocating more wages, shorter time, regulated prices and government to stand some of the losses in production [XV, 585].

Mar. 25—Conferences between Industrial Board of Department of Commerce and the National Coal Association for the stabilization of price open at Washington, D. C.—Bill introduced into Pennsylvania House of Representatives providing for a 1 per cent. tax on all coal produced in the state [XV, 642].

Mar. 26—Conference between National Coal Association and Industrial Board to provide stabilized prices for coal [XV, 625].

Mar. 27—Conference for stabilization of coal prices ends, the National Coal Association declaring that the United States Railroad Administration is not willing to agree to buy coal at the price to be named but desires to get coal below cost at the expense of the smaller consumer.

Mar. 29—30,000 men on strike in the mines around Essen, Germany [XV, 721].

Mar. 31—Explosion at the Aguilar mine of the Empire Coal Co., in Las Animas, Col. Twelve men are entombed [XV, 686].

Harrisburg, Penn.

At present writing it appears probable that the Pennsylvania legislature will pass a resolution which will provide for an inquiry into the possibilities and advantages of health insurance and that it will abandon the proposed industrial accidents commission. Plans for health insurance and old-age pensions have been studied under action taken in 1917, especially in relation to the possibilities of establishing safeguards of this character against poverty and distress in industrial communities.

These inquiries will now be made more extended and, if present plans do not miscarry, the reports will be presented in the session of 1921 when the proposed commission for a revision of the constitution will also report. Those interesting themselves in the proposed legislation are disposed to make haste slowly, feeling that large changes are in the air and that it would be a mistake to enact legislation that would have to be changed in a few years.

Workmen's compensation is likely to occupy much of the attention of the legislature during the concluding weeks of the session of 1919. Efforts were made in the last session to change the law so as to provide for larger allowances, but it was thought best to let the code of 1915 prove its value or its need for revision by a further test of time. This year, however, the trend of public sentiment seems to favor changes, and the experiences of the last year are held to show the need for alterations. There are not lacking those who are vociferously and persistently advocating a larger measure of compensation.

During the week's recess of the legislature amendments have been prepared, for submission to the legislators, which will give the compensation board power to order direct payment to any dependent minor. It is said that this provision will make it unnecessary to appoint guardians where small amounts only are involved.

The problem as to who shall be deemed to be a dependent is to be settled by the provision that "an employee, who has been a member of the household of his parents and who has within the last six months prior to the accident or death contributed any part of his earnings to its maintenance, shall be conclusively presumed to have been a dependent." The bituminous coal interests have for a long time opposed such a definition.

Compensation which was payable before to a widow, widower, parent or grandparent for a period of 300 weeks will now be lengthened to cover 400 weeks, and it is stipulated that if a widow remarries she is to be given a lump payment in lieu of part of the compensation then payable. It is claimed that the insurance companies, which have much experience in these matters, favor this disposition of the problem.

Pittsburgh, Penn.

In order to provide adequate facilities for a large increase expected in the student body of the school, the School of Mines of the University of Pittsburgh this week has moved from State Hall, in which it has been housed for the last ten years, to buildings on the upper part of the University campus.

The National Retail Coal Merchants' Association met at the Fort Pitt, Apr. 12, and resolved to seek representation in any scheme of distribution that the Government may establish during the period of reconstruction and to encourage early buying of coal.

J. L. Lewis, acting president of the United Mine Workers, declared Apr. 11 that the miners' organization would be obliged to take "drastic action" unless there is a change of policy on the part of Director General Hines. "Since I have been in Pittsburgh," said Mr. Lewis, "I have learned that he is making contracts for coal during April. The custom has been to contract for six months' supplies. This means that the Director General will arrange to get coal during May for less than he paid in April."

Charleston, W. Va.

More progress is being made by the coal industry of West Virginia in building up foreign trade than in getting back the trade suddenly cut off when the armistice was signed. The biggest factor in preventing a return to normal conditions insofar as West Virginia is concerned is the pronounced uncertainty as to just what the future holds, an uncertainty which has only been more keenly accentuated because of the destructive policy of the Railroad Administration. The only fly in the ointment in the growing foreign trade is found in the insistence of the foreign buyer that all coal be furnished in special sizes, no slack being acceptable. This entails the screening of the coal and the storing of the slack.

W. J. Heatherman, Chief of the West Virginia Department of Mines, has announced the appointment of four additional mine inspectors under the terms of the Hale bill re-creating the department. This will bring the total number of inspectors up to 19.

The four new inspectors are W. B. Rigglesman, of Fairmont, recently in the mine rescue service, for the Fifth district; J. G. Vaughan, of Montgomery, for the Eleventh district; Edward Nicholson, of Thurmond, for the Twelfth district; and L. D. Vaughn, of Jaeger, for the Eighteenth district.

The 15 inspectors reappointed and re-assigned are: S. E. Hawkshaw, of Thomas, First district; W. H. Sandridge, of Grafton, Second district; Evan L. Griffiths, of Clarksburg, Third district; James Golden, of Morgantown, Fourth district; M. B. Coulter, of Moundsville, Sixth district; Eli J. Mason, of Charleston, Seventh district; E. L. Brewer, of Charleston, Eighth district; Zach Evans, of Handley, Ninth district; L. B. Holliday, of Whitesville, Tenth district; R. M. Lambie, of Mt. Hope, Thirteenth district; V. E. Sullivan, of Beckley, Fourteenth district; Thomas Stockdale, of Bramwell, Fifteenth district; H. L. Butler, of Welch, Sixteenth district; J. W. P. St. Clair, of Williamson, Seventeenth district; and R. L. Jenkins, of Logan, Nineteenth district.

Fairmont, W. Va.

The opinion is generally prevalent among West Virginia coal operators that there will be no appreciable lake business insofar as this state is concerned until well toward the latter part of May. There is still a large stock of coal on hand in lake territory from last year's shipments, and from all the information lake shippers can gather there will still be between 3,000,000 and 4,000,000 tons on hand after the middle of May. As large Ohio consumers still appear to have much coal stored so, for the time being, there is not much prospect of a good market in Ohio manufacturing centers.

While somewhat puzzled as to the necessity of the recent order from the Interstate Commerce Commission requiring coal to be purchased by the railroads only upon competitive bids, operators from the Fairmont district insofar as they have had an opportunity to study the order are inclined to look upon it as a part of the effort to reduce the price of coal. Coal producers are not inclined to believe that it will accomplish that object if such is its purpose. The order was transmitted to members of the Northern West Virginia Operators' Association by George T. Bell, the vice president, and reads as follows:

"To All Members—Please be advised that in accordance with section ten of the so-called Clayton act, the Interstate Commerce Commission has prepared regulations requiring the railroads to purchase supplies of all kinds by means of competitive bids, these competitive bids to be publicly opened. The commission has served notice on the railroads and the Director General of Railroads to show cause on or before May 15 why these regulations should not be put into effect immediately. The regulations provide that each bidder will have the right and opportunity to be present in person or by duly authorized agent at the time the bids are opened, and that a tabulated list of all bids will be furnished each bidder or his representative if requested."

Lead, S. D.

Pursuant to the wishes of the citizens of South Dakota, as expressed by the adoption of an amendment to the state constitution at the last election, whereby the state is to engage in coal mining, the Legislature of 1919 passed an act authorizing the appointment of a coal commission with full power to engage in the mining, sale and distribution of coal. The commission is composed of three members, of which the Governor is to be chairman. The act further provides for the acquiring of property by purchase or condemnation and appropriates money therefor.

South Dakota has lignite coal areas extending through Harding, Perkins, Corson, Dewey, Ziebach and Meade Counties, and the amount of available fuel is estimated at two billion tons. Many of the districts are so far distant from a railroad as to make their utilization impractical at this time, but those favorably situated will be investigated with a view to furnishing fuel for state needs. Investigations have been started in Dewey County to determine the extent, thickness of seams and overburden, and upon the result of this work will depend the future of this new industry. Should conditions warrant, the state will enter coal operations on a large scale with steam shovels for both stripping and mining. Much depends on the preliminary investigations, and the field will be thoroughly tested before steps are taken looking to a production of this fuel.

Victoria, B. C.

New coal areas are being developed both on Vancouver Island and in parts of the British Columbia interior. On the Island licenses have been applied for in the Comox district, and it is understood that T. R. Stockett, formerly of the Western Fuel Co., Nanaimo, B. C., is organizing a company in Seattle to develop the coal of these lands. H. W. Treat, of Seattle, also is proceeding with his preparations to open up areas which he has acquired on Chehalis Harbor, apparently confident that the Provincial title, which he has acquired will be upheld by the Privy Council. Besides, it is authoritatively announced that coal measures 2½ miles south of Kamloops, B. C., are to be worked again after many years. Some eighteen years ago the blacksmiths of Kamloops and some of the householders of the community used to burn this coal. James L. Brown, of Vancouver, has held the ground for some time. Accompanied by David Evans, consulting engineer, Mr. Brown has returned from an inspection of the property and, as a result of Mr. Evan's examination and on his recommendation, a diamond drill is to be used to determine the extent of the coal measure. The coal is highly bituminous in character and the measures are reported by Mr. Evans to be of the same age and series as those of Vancouver Island.

New York, N. Y.

The War Department will open bids in Washington on May 7 for delivering approximately 2,500,000 tons of bituminous coal during the year beginning July 1 to the various army posts, camps, hospitals, etc., under its jurisdiction throughout the country.

The requirements for the camps, etc., in New York State are given as follows.

Camp Mills, Hempstead, L. I., 19,200 tons run-of-mine; Camp Upton, 30,200 tons run-of-mine; Fort Wadsworth, Staten Island, 720 tons run-of-mine; Watervliet Arsenal, Watervliet, 5894 tons run-of-mine; Army Reserve Dept., South Schenectady, 2900 tons run-of-mine; Fort Slocum, 1200 tons run-of-mine; Stores and Warehouse Division, Governor's Island, 960 tons 2½-inch lump; Fort Terry, 1392 tons run-of-mine; Air Service Depot, Garden City, 10,000 tons run-of-mine; General Hospital No. 38, Eastview, 6000 tons run-of-mine; General Hospital No. 5 and Fort Ontario, Oswego, 4950 tons run-of-mine; General Hospital No. 1, Williamsbridge, 865 tons run-of-mine; General Hospital No. 8, Otisville, 5970 tons run-of-mine; Port Utilities Office, New York City, 420,000 tons run-of-mine (this tonnage for bunkering transports; only bids specifying recognized classified bunker coal will be considered).

Included in the requirements for New Jersey are: Fort Hancock, 2700 tons run-of-mine; Engineer Depot, Kearney, 10,800 tons ½-in. lump; Camp Dix, 10,200 tons run-of-mine, Army Supply Base, Port Newark, 8300 tons run-of-mine; Raritan Arsenal, Metuchen, 11,400 tons run-of-mine; General Hospital No. 3, Rahway, 19,520 tons 4-in. lump; Amato Arsenal, Amato, 29,500 tons run-of-mine.

PENNSYLVANIA

Anthracite

Yorktown—After an idleness lasting since last February, caused by the light demand for anthracite coal, the Jeanesville and Yorktown collieries of the Lehigh Valley Coal Co. started work on Apr. 15.

Shenandoah—Two men were instantly killed and six other firemen narrowly escaped with their lives when a steam boiler burst at the Locust Gap colliery of the Philadelphia and Reading Coal and Iron Co. The men were employed at the boiler house as firemen and both were buried beneath tons of debris. The boiler left its foundations, sailing 25 ft. into a bank of rice coal. Three other boilers were damaged.

Sunbury—An attempt will be made to induce the County Commissioners of Northumberland County to raise the assessments on coal land from \$17,000,000 up to a much larger figure. T. Ellsworth Davies, of Scranton, estimates that there are 3,803,710,965 tons of coal in the county. On this estimate some fearful and wonderful estimates of valuation are being based.

Hazleton—Rumors are current that the Lehigh Valley Coal Co. and C. M. Dodson Co. are negotiating for the purchase of the G. B. Markle Co.'s collieries, the largest independent anthracite operations in the world.

Pottsville—The Tax Revision League has charged the county commissioners with making a "fraudulent and illegal assessment" of the coal lands in Schuylkill County. M. L. Ryan, counsel for the league, seeks to have the assessment set at least \$200,000,000 higher than the figure set by the commissioners.

Wilkes-Barre—The air shaft at the Harry E. Colliery of the Forty Fort Coal Co. caught fire and was destroyed on Apr. 8. At that time 500 men were underground and their lives were endangered, but the mine was cleared without accident. The fire lasted several hours and the operation of the colliery may be delayed several days. On the same day in the evening the washery of the Red Ash Coal Co. in Laurel Run Borough, which is a source of employment to 150 men was destroyed by fire. Its value was about \$100,000.

Bituminous

Elizabeth—The Pittsburgh Coal Co., which absorbed the Monongahela River Consolidated Coal and Coke Co. has gradually been withdrawing from the river trade. It has just ordered the dismantling of six of its big river boats which were at one time among the most powerful tow boats in western waters. They were used to tow coal from Pittsburgh to Southern ports.

Punxsutawney—The Rochester and Pittsburgh Coal and Iron Co. has closed down the Walton No. 3 Slope mine, which was opened nearly 40 years ago and was the oldest producing mine of large size in this section. It is doubtful if the plant will ever be operated again as the coal is practically worked out. The same company closed ten of their large mines in Indiana County.

Brownsville—The following coal and coke plants in the Lower Connellsville coke region, in Fayette County, have closed down indefinitely during the past week: the Royal ovens (365 ovens) of the W. J. Rainey Coke Co. at Royal Works, on the

Pennsylvania R. R. (the mine here is still operating, shipping coal); the Atlas Coke Company (220 ovens) at Helen, on the Pennsylvania R. R.; and the Union Connellsville Coke Co. (140 ovens) at Simpson, on the Monongahela R. R.

Blairsville—Paul Minko, aged about 27 years, the unnaturalized Russian resident at Idamar, who set fire to the tippie of the Idamar Coal Co. Apr. 5, completely destroying it, confessed the crime here and has been sentenced by Judge Langham to pay the costs of prosecution, a fine of \$500 and to undergo imprisonment in the Western Penitentiary by separate and solitary confinement for a period of not less than three years and not more than seven years. The temporary tippie has been completed and the mines are again in operation. Minko was incensed at the company because his boarding mistress collected an unpaid board bill through the company's office. By Apr. 9 17,000 ft. of lumber had been used in replacing the burned structure which was already being used for the dumping of coal.

WEST VIRGINIA

Fairmont—Mine No. 11 at Monon belonging to the Jamison Coal and Coke Co., resumed operations on Apr. 10. It is said that export orders via Curtis Bay are the cause of this revival of activity.

Fayetteville—Under the terms of a verdict against the Long Branch Coal Co. awarded in the Circuit Court of Fayette County, May Donald, hardly more than a child, was awarded \$19,000 damages. The company after moving to set aside the verdict gave notice of an appeal. The plaintiff's claim was that amputation of her right arm had been necessary as the result of being struck by the truck of a mine car which had become derailed.

A loss of fully \$100,000 was sustained when fire destroyed practically the entire business section of Smithers, a Fayette County mining town, though none of the coal plants appear to have been damaged by the fire. The loss sustained is in effect total, as few of the buildings destroyed were covered by insurance.

Elkins—The Weaver mines of the Doris Coal & Coke Co. are now being operated on a full time basis. Other mines in the same section which are also being operated without any break are the mines at Arden. Railroad requirements are said to be partly responsible for the continuity of operations.

Kingwood—The mines in Preston county working in the upper Freeport seam of coal are practically idle on account of lack of business except the Tunnellton mine of the Merchants Coal Corporation and the Car-Diff mine of the Car-Diff Coal Co., both of which are working on Baltimore & Ohio R. R. contracts.

Keyser—At a recent meeting of the Upper Potomac and Georges Creek operators they voiced complaints regarding discrimination by the railroad administration alleging that it hauled coal long distances at a loss in order to secure a low price for coal for its own use. The members also declared themselves in favor of a dissolution of the Tidewater Coal Exchange.

OHIO

New Straitsville—Claiming that they are on the point of starvation because of lack of work, coal miners in this region have appealed to Governor Cox to have pressure brought on the Railroad Administration for a more equal distribution in railroad contracts. The miners point out that some of the mines have been working full time while others have been idle since Nov. 11. They urge a special investigation on the ground that many miners are returning from service and have no work.

ILLINOIS

Duquoin—One of the largest conferences of its kind will be held here Friday, May 9, when representatives of miners, operators and school authorities from all over the southern Illinois district will convene for a joint discussion on vocational training for miners.

Murphysboro—Much improvement has lately been noticed in the work of the mines in the coal fields of Jackson county. Blair's mine at Murphysboro, together with Big Muddy No. 9 and No. 10, have worked practically every day during the last two weeks. No reason is given for this sudden increase, and it is not known how long it will last.

Benton—The Benton Coal Co. broke its record Saturday, Apr. 12, with 2800 tons and 1044 dumps. Its previous record was 2634 tons and 927 dumps. The mine, which is an old one, has greatly increased its output since the new superintendent, Walter Nichols, has been on duty, and the company hopes soon to reach the 3000 ton mark.

Clifford—The big mine of the Big Muddy Coal and Iron Co. has resumed operations after having been closed down since last November. During the time the mine was closed down extensive improvements and repairs have been made. A new wash-house has been constructed.

IOWA

Sioux City—The Sioux City Coal Exchange will bring suit against Iowa railroads to compel a reduction in rates on the ground that high freight rates are interfering with the city's industrial development. Kansas City, Mo., has a freight rate from the Iowa fields of \$1.10, whereas Sioux City consumers have to meet a freight rate of \$1.50 to \$1.75 a ton.

KENTUCKY

Versailles—The Farmers Union Supply Co., a cooperative corporation started by farmers for the delivery of coal in Versailles, has purchased a coalyard in that town and expects to increase its capital stock from \$15,000 to \$35,000 in order to finance the new venture. The coal will be brought in by railroad, and the farmers who need supplies will haul it away, the coal being stored in concrete bins.

NORTH DAKOTA

Scranton—The three-unit briquetting plant of the Johnson Fuel Co. at this place is nearing completion and will be placed in commission some time during May. The present arrangement utilizes three Fernholz briquet presses with a daily capacity of 75 tons briquets each. The plant is a large brick structure with sufficient room for eight presses, and it is probable that the full space will be used as soon as conditions permit, giving a daily capacity of 500 tons. No binder is used in the manufacture of the briquet and the fuel finds a ready market. The coal is obtained from the Scranton lignite mine and is recovered by underground and open pit methods of mining. Steam shovels are used in stripping and also for loading the coal and sufficient coal has been uncovered to keep the present plant in continuous operation for several years. The overburden has an average depth of 18 ft., but in places reaches 50 ft. The coal seam averages 18 ft. in thickness and extends through the entire field. Two steam shovels are used at the property, one having a 2-yd. bucket and the other a 2-yd. bucket.

COLORADO

Denver—William Wardell, a mine foreman, and Joseph Jackson, a fireboss, were blamed for the explosion in the Empire mine, Aguilar, Colo., in a report by the chief inspector. The foreman failed to withdraw the men when the fan stopped, and the fireboss was remiss in reporting the condition of the mine.

WASHINGTON

Chehalis—Extensive operations on coal lands lying west and northwest of Vader, in southern Lewis county, are being secured by people who are said to represent Portland capitalists and others.

Issaquah—A ton of dynamite in the powder house of the Pacific Coast Coal Co.'s coal mine at this place exploded on Saturday night, Apr. 5. The town was rocked, several mine buildings being wrecked and a number of other houses damaged. The loss is estimated at between \$5000 and \$10,000. No one was injured. John Kerr, night watchman, explains that he was making his rounds and was due to register at 10 o'clock. He was nearing the powder house when he noticed smoke, and stepping closer recognized the spitting flame of a fuse. Kerr turned and ran toward the office, reaching it just as the powder house went up. Besides shattering windows in many of the houses in the immediate vicinity, the side of the compressor house was blown in. It is not thought, however, that the compressor or other machinery was damaged. The timbers at the mouth of the mine were blown down. It is suggested by the evidence that the explosion was deliberately planned, and in this connection it is recalled that the Issaquah Coal Mining Co., as it formerly was known, was controlled by Alvo von Alvensleben, a German interned at Fort Douglas, Utah, and who is said to have been backed by the personal capital of his emperor. Alvo von Alvensleben, it may be stated parenthetically, had coal mining interests in British Columbia, the most notable being what is commonly known as the Jingle Pot mine, Vancouver Island, which still is a producer.

Personals

Harry S. Lewis, formerly sales manager for the Reilly-Peabody Fuel Co., is now

manager of sales for the International Fuel Corporation, Pittsburgh, Penn.

W. S. Neal who has been connected with the Standard Pocahontas Co., will be retained by the Central Pocahontas Coal Co., its successor, as superintendent at its No. 3 plant.

T. J. Hudson, of the Chicago Pneumatic Tool Co., Chicago, Ill., has been appointed acting manager of the pneumatic tool sales division, effective Apr. 15, succeeding **F. H. Waldron**, who returns to Minneapolis, Minn., as district manager of sales for the Minneapolis territory.

Mr. Miller, who has at different times been superintendent of various mines of the Pittsburgh Coal Co., has assumed the position of superintendent of the Edna mines of the United Coal Corporation, of Pittsburgh, Penn., taking the place left vacant by the recent resignation of Joseph Maize.

Walter H. Greene has become associated with Whitney & Kemmerer in their New York office, 143 Liberty Street. Mr. Greene was for seven years connected with the firm of Pattison & Bowns, 1 Broadway. He served in the United States Air Service during 1918 and was promoted to lieutenant.

Stanley Gleason has resigned as division engineer of the Pittsburgh Division of the United Coal Corporation. This division has been consolidated with the Somerset division and the work taken care of by **F. A. Wyant**, formerly engineer of the latter division, whose headquarters have been transferred to Pittsburgh, Penn.

Arthur A. Allan, of Wilkesburg, Penn., has resigned as assistant general superintendent of the United Coal Corporation of Pittsburgh, Penn., effective May 1. No successor to Mr. Allan has been appointed, but the duties of the position will be taken care of between Harrison T. Booker, general superintendent, and J. D. Martin, chief engineer.

Walter E. Hope, who was director of State Organizations for the United States Fuel Administration, has been nominated to be alumni trustee of Princeton University for five years. His election is assured in June. Mr. Hope, who is a member of the law firm of Masten & Nichols, New York City, was chairman of the special Government Commission sent abroad last Fall to investigate fuel conditions in Great Britain, France and Italy.

Obituary

Charles Baxter Greene, 71 years old, who for 55 years was connected with the coal department of the Delaware, Lackawanna & Western R.R. Co., and later with the Delaware, Lackawanna & Western R.R. Co. Coal Department, died at his home in Brooklyn on Apr. 13. Mr. Greene was born in Manhattan and was a descendant on his mother's side of Robert Morris, one of the signers of the Declaration of Independence.

Robert Lee died in Rock Island, Ill., after 51 years of service with the Coal Valley Mining Co. He began work with the company Sept. 11, 1856, becoming a mining engineer and holding a position as superintendent of the railroad of the company for a number of years. He was in the mercantile business for himself for some time, but in August, 1875, returned to the coal-mining business as head of mining operations in Mercer County, for the Coal Valley company. He remained until Sept. 11, 1907, 51 years after having taken service with the company. He was succeeded by his son, Robert E. Lee, who is now president of the Coal Valley Mining Co.

Industrial News

Chicago, Ill.—Briggs & Turivas, Inc., iron and steel, have opened a New York office at 1805 Equitable Trust Building, to be under the direction of Carl R. Briggs, president of the corporation.

Morgantown, W. Va.—The Monongahela Railway will be compelled to furnish the Arden Coal Co. sidetrack facilities at Round Bottom, W. Va., the Public Service Commission having handed down a decision directing the railroad company to install the siding.

Wilkes-Barre, Penn.—The Hudson Coal Co., has given up its Leggett Creek operations in North Scranton and on May 1 an application will be made to the governor of Pennsylvania for a charter for an intended company to be known as the Leggett's Creek operation in North Scranton.

Columbus, Ohio—The Ohio Blue Ridge Coal Co., which had opened offices in the

Brunson Building several months ago, has closed. Allen Pyne, the president, has retired from the coal business and Jay Millar, the secretary, has taken the position of sales manager for the Central West Coal and Lumber Company.

Buffalo, N. Y.—There were seven formal and four informal bids for the city waterworks coal contract, some bidders refusing to conform to the specifications, which were called unnecessarily rigorous. The lowest formal bid was of the Valley Camp Coal Co., of Cleveland, \$1.971 per net ton of 48,000 tons of slack, mine price, on a freight rate of \$1.70. The highest formal bid was \$2.50, same conditions.

Chicago, Ill.—The Winslow Boiler and Engineering Co., which is about ready to go into the production of its new model "Steamobile" truck, would be glad to receive catalogs from makers of steam boilers and heaters, oil-burning apparatus, steam engines, apparatus for burning pulverized coal, steam valves, unions and fittings for high pressures and temperatures, machinery and shop tools and equipment. The literature should be addressed to the factory, 530 No. Western Ave., Chicago.

Philadelphia, Penn.—The Lehigh & Wilkes-Barre Coal Co., in its annual report, shows net earnings of \$3,069,280 for 1918, after interest and taxes, against \$5,431,900 in 1917, a decrease, roughly, of more than 40 per cent. The Barrett Co., a producer of coal-tar derivatives, made its annual report on the same day as did the Lehigh & Wilkes-Barre. It shows that the 1918 net profits, after Federal taxes and charges, were \$3,947,783, against \$3,728,302 in 1917, or an increase of more than 5 per cent.

Columbus, Ohio—M. S. Connors, Federal manager of the Hocking Valley R. R., announces that there are 14 coal vessels at the Toledo docks awaiting the arrival of coal to be loaded for the Northwest. These boats have a carrying capacity of approximately 125,000 tons. May 1 is the date set for the official opening of the lake trade, although several cargoes have been loaded and are under way. The main lake trade is not expected to be active until after the middle of May. Reports from the Northwest show that the expectancy for lake shipment is 21,000,000 tons as compared with between 28,000,000 and 29,000,000 tons last year.

Columbus, Ohio—A reorganization of the Sunday Creek Coal Co. has been effected by the incorporation of that concern under Ohio laws with a capital of \$7,500,000. Of the capital, \$6,000,000 is common stock and \$1,500,000 preferred stock. The company will take over the properties of the Sunday Creek Coal Co., of New Jersey, the Buckeye Coal and Railway Co. and the Ohio Land and Railway Co. There has been considerable litigation about these properties during the past five years, but now all is cleared up and the new company without any indebtedness and under the management of John S. Jones, of Chicago, will be in a position to carry on the business formerly conducted by the three separate companies.

Philadelphia, Penn.—At the annual meeting of the Anthracite Coal Operators' Association, held at the Bellevue-Stratford, Apr. 3, Percy C. Madeira, of Madeira Hill & Co., was elected president, and John Markle, of G. B. Markle & Co., Inc.; W. L. Connell, of Connell Anthracite Mining Co., and Alan C. Dodson, of Weston Dodson & Co., Inc., vice presidents. Howard W. Perrin, of Susquehanna Collieries Co., is treasurer and W. J. Thompson, of Bethlehem, Penn., is secretary. The office of secretary, formerly held by Alan C. Dodson, will be moved to Philadelphia in the near future. The association has been in existence for three years. It comprises eighty companies operating ninety-nine collieries. Its members produce about 90 per cent. of all the coal mined by the individual operators.

Madrid, Spain—The consulate in Madrid desires up-to-date catalogs representative of all phases of American industry and commerce. The potential importance of the Spanish market in itself and its influence on the Latin-American markets have already been brought to the attention of American manufacturers and exporters. The peculiar situation of Madrid as the geographical, railway, financial and political center of this Spanish market is well known, and the advantage of having such catalogs on file in the Madrid consulate for ready consultation by local distributors to the Spanish trade and by visiting merchants from the Provinces is clearly apparent. Ely E. Palmer is consul. \$60,000 to \$85,000. It is understood that the increase will be used for proposed expansion.

MARKET DEPARTMENT

EDITED BY ALEX MOSS

Weekly Review

Ending of Port Strike Will Help Tidewater Shipments—Improved Bituminous Output—Industrial Demand for Soft Coal Not Large—Railroad Controversy Not Yet Settled—Anthracite Industry Enjoying Renewed Prosperity

THE ending of the harbor strike in the port of New York brought heartfelt sighs of relief from dealers and consumers who depend upon water carriage for their coal supply. Vessels are being speeded to tidewater as quickly as possible, and the resumption of water-borne fuel shipments to points on the two rivers and Long Island Sound will prove of material benefit to a large number of operations whose output has been embargoed for the past six weeks.

Production of bituminous coal during the week ended Apr. 12 mirrors the noticeable betterment in demand. The total output of the mines of the country for that week is estimated at 7,417,000 net tons, as against 6,967,000 net tons during the week ended Apr. 5.

Demands for coal for industrial purposes are still insufficient in aggregate to keep all the soft-coal mines working full time. Many operations are closed down, while others work only two or three days a week. The mine workers in many regions have petitioned the governors of their respective states to bring pressure to bear upon the Railroad Administration, to the end that

the working time at the mines be equalized. At present the anomaly is presented of some mines in a district working nearly full time on contracts for railroad coal, while other operations in the same field are idle because the railroad purchasing agent has placed all the business for his road with a few favored operators.

The railroad fuel problem has served to impede the progress of the soft-coal industry for years. The matter assumes new phases and angles with such frequency that no sooner is one question in controversy settled than another development manifests itself to plague the operators. Like Banquo's ghost, it will not be downed. Latest reports have it, however, that an amicable understanding will be arrived at in the near future.

Industry in general has not yet resumed its maximum activity. As a consequence the consumption of fuel at this time is comparatively negligible when it is remembered that the soft coal operators can produce well over 600 million net tons of coal a year. The good grades of bituminous are finding a ready market, and it is gratifying to

record that no idiotic price-cutting, with all its attendant evils, is in evidence. Prices are being held at the former Government figures, and quite a little contract business has been closed on this basis. In short, it can be stated that the soft-coal market is satisfactory, with all indications pointing to a slow but steady improvement.

News from the anthracite field is cheering. Operations that have been closed down for months are now working anew, and if present conditions continue the fear of a coal shortage next winter can be dispelled. The admonishments to householders that they order their coal early seem to be bearing fruit, for the sales of domestic sizes are reported to be satisfactory.

The small sizes of anthracite continue to drag, though the opinion is expressed in some quarters that steam coal will find more favor within the next two months as the result of increased industrial activity. During the week ended Apr. 12 it is estimated that 1,750,000 net tons of anthracite were sent to market, about half a million tons more than the output of the week ended Apr. 5.

WEEKLY COAL PRODUCTION

The output of bituminous coal during the week ended Apr. 12 was a considerable improvement over the tonnage produced during the week preceding. Estimates place the current week's output at 7,417,000 net tons, as compared with 6,967,000 net tons during the week ended Apr. 5. As in previous weeks, the current week's production fell far below that of the same week of 1918, the decrease amounting to 3,300,000 net tons. For the calendar year to date the output is estimated at 120,840,000 net tons, and falls approximately 35,000,000 net tons behind the output during the same period of last year, estimated at 155,308,000 net tons. The average production per working day during the week ended Apr. 12 is estimated at 1,236,000 net tons, as compared with 1,373,000 net tons for this calendar year to date, and 1,765,000 net tons for the preceding year.

The production of anthracite in the United States during the week ended Apr. 12 is estimated at 1,750,000 net tons and exceeds the previous week's production by one-half a million net tons, but falls behind the output of the corresponding week of last year by 120,000 net tons. The total production for the calendar year to date is estimated at 20,693,000 net tons, as compared with 27,434,000 net tons during the same period of last year. The daily average per working day during the current week is estimated at 292,000 net tons, compared with 235,000 net tons for the calendar year to date, and 312,000 net tons for the period Jan. 1 to Apr. 12, 1918.

Carriers' reports for the week ended Apr. 12 shows an increase in loading in all fields with the exception of the Illinois, Indiana and western Kentucky district. In this district the decrease amounted to 1500 carloads while considerable improvement oc-

curred in central Pennsylvania, where the increase over the week preceding amounted to 3063 carloads; in western Pennsylvania, 1450 carloads; in Ohio, 1723 carloads.

Shipments of bituminous coal from the tidewater harbors to all points during the week ended Apr. 12 are estimated at 484,169 net tons, and exceed the previous week's shipments by approximately 14,000 net tons. Compared with the same week of last year, the tonnage moved during the current week was 237,423 net tons lower. Improvement occurred during the week at New York and Baltimore, while at Philadelphia and Hampton Roads slightly less tonnage was moved than was reported during the week ended Apr. 5.

Bituminous coal shipped to New England by tidewater during the week ended Apr. 12 is estimated at 117,478 net tons, and with the exception of Philadelphia's movement of 172 net tons, the tonnage loaded for the week originated at either New York or Hampton Roads. The tonnage loaded at New York exceeded that of the preceding week by 4000 net tons, while Philadelphia's tonnage decreased to practically nothing during the current week, and Hampton Roads tonnage fell behind that of the preceding week by 3600 net tons. The current week's movement was but 43 per cent. of the tonnage loaded during the corresponding week of 1918.

The production of beehive coke in the United States during the week ended Apr. 12 is estimated at 318,458 net tons, and is the lowest production recorded in recent years. This low tonnage was approximately 31,000 net tons below the production of the week preceding, and was but 55 per cent. of the output of the week of Apr. 13, 1918. The large falling off during the current week was localized in Pennsylvania where the decrease, compared with

the week preceding, amounted to approximately 27,600 net tons. West Virginia also fell behind slightly, while in the other states little change occurred compared with the week of Apr. 5. The daily average during the week ended Apr. 12 is estimated at 43,076 net tons, as compared with an average daily production for the calendar year to date of 75,504 net tons, and in the same period of last year of 93,684 net tons.

BUSINESS OPINIONS

American Wool and Cotton Reporter—The demand for fine wools at an advancing tendency is a feature of the wool market. It is expected, however, that low wools will also be in demand soon in larger quantities than they are at present. A few of the manufacturers are declining to sell goods more than two months ahead, feeling that values will be greater later. A fair demand for cotton from the mills has been evident during the week under review, but it is not anywhere near as large as it might be. Cotton is really in a strong position until a substantial crop is in sight.

Marshall Field & Co.—Current wholesale distribution of dry goods is running a little below the high figure of the corresponding week a year ago. Retailers were very busy with Easter trade and not so many were in the market as compared with recent weeks. There have been advances in the price of staple cottons and the firm tendency of the market has stimulated business for fall. Orders from road salesmen for both immediate and future delivery were larger than for the same week of 1918. Collections are satisfactory.

The Iron Age—While they wait for a final decision of the question whether the Government will help or hinder the effort to encourage buying of iron and steel, pro-

ducers are doing little new business and are showing no great concern about the course of prices. The widespread propaganda of the Department of Labor and in many lines of trade and industry in behalf of wage and price maintenance has even robbed an open market of some of its old-time terrors. Meanwhile ultimate consumers of such products as wire and pipe are in the market with their small needs, which jobbers are passing on to the mills, but nowhere along the line is any stock being accumulated. On what they are selling, mills are getting in nearly all cases the prices named at Washington on Mar. 20.

Dry Goods Economist—An important development of the week is the new light thrown on the price trend. While retailers are skeptical, and naturally so, of predictions as to higher quotations coming from those from whom they buy, it is certain that due attention should be given to the statement issued by the National Wholesale Dry Goods Association, at its meeting, to the effect that the bottom has been reached. The jobbers also declare that scarcity is apparent in several lines, and in view of this condition they predict not only the maintenance of present prices but also a movement toward higher levels.

Atlantic Seaboard

BOSTON

Little change in generally dull market. Railroad buying awaited with much interest. Prices on better grades so far unaffected. Only scattered sales all-rail. Hampton Roads shippers sadly need orders. Freight rates do not induce buying. Needs of New England this year over-estimated. All-rail demand steady, but less than normal for April. Retailers well supplied with orders.

Bituminous—The market may still be described as generally dull. The past week has shown no significant development; prices and requests continue without material change. The larger buyers are still withholding inquiries and for the next thirty days it is hard to see how there can be any decided move in any direction. Neither all-rail nor in the West Virginia districts can operators show more than 50 per cent. output, and that mark in production is just about met in New England by 50 per cent. consumption on the part of many of the industrials, textiles in particular.

So far prices on the quality grades have remained unaffected by the low figures used in connection with railroad purchases; \$2.95 per net ton is a fairly firm price for a large number of coals from the South Fork region in central Pennsylvania, and today it seems to matter little on these grades whether the price sought is for contract or for spot shipment. There are still a few special coals on which higher prices are named. Sales of the latter are confined to instances where the coals are well known and are required because of coking or other preferred characteristics. The grades that sell down to \$2.50 have today only a restricted market, so pronounced is the attitude of most buyers in favor of the coals of recognized higher value. Freight rates are so high to this territory that 15c @ 25c, on the delivered cost is considered negligible, and as the season advances buying sentiment is more and more discriminating.

All-rail territory has yielded only scattering sales the past fortnight. To find spot buyers the most careful combing is required, and the volume is very light. Those within 50 miles or so of tidewater are also watching developments on West Virginia coals by water. In normal years there have been plenty of opportunities to buy these coals at relatively low cost, and so far a large number of buyers see no reason why this season should not show similar developments. The export demand is not regarded very seriously here, as yet, and it is generally looked upon as too early to take on large tonnages while there are still ample stocks in reserve.

It is certain the Hampton Roads agencies sadly need orders for current shipment. There are large accumulations at the piers, and no snap to the demand from any direction. The number of bottoms loaded for New England is very small, and most of the distributing factors here are simply waiting for something to turn up. A fair market for prepared coal is reported from the west, but this is of help only to those shippers who have outlets for their slack. For run-of-mine there is only a hand-to-mouth demand in this territory from regular contractors, and those only who take

their supplies either directly on the seaboard or who are short distances inland. Prices on the basis of \$2.75 per net ton f.o.b. mines for both Pocahontas and New River are being maintained fairly well by the larger shippers, but there is quite a tonnage available through smaller factors that can easily be had on the \$2.35 basis for both coals.

The lower rates on bottoms from Hampton Roads have not influenced buying, so far as we can observe; \$2 is now the freight rate on either steam or barge tonnage from Norfolk to Boston, Providence, R. I., being 25c. less, and it is hardly expected that barges will move later at any material reduction from this basis. For New York loading to points on Long Island Sound rates are firm at \$1, mainly for anthracite, but this has a bearing on freights from Hampton Roads. So long as such rates as these can be had for short distances the owners of barges will be unlikely to send them to Norfolk for very much less than \$2. There is reason, therefore, for the prediction that Southern water rates are probably on as low a level as will obtain the present season.

Bituminous prices at wholesale are about as follows, f.o.b. mines and at loading ports, per gross or net ton as designated:

	Clearfields	Cambria and Somersets
F.o.b. mines, net tons.....	\$2.15@2.75	\$2.80@3.35
Philadelphia, gross tons....	4.20@4.90	5.00@5.40
New York, gross tons.....	4.50@5.25	5.35@5.80
Alongside Boston (water coal), gross tons.....	6.10@6.85	6.90@7.65

Georges Creek is quoted at \$3.20 f.o.b. mines per net ton.

Pocahontas and New River are unchanged at \$4.69 @ 5.15 f.o.b. Norfolk and Newport News, Va., per gross ton, according to the shipper, for spot or contract. Alongside Boston the present gross ton range would be \$7.15 @ 8.10. It is understood that factors are naming \$7.90 per gross ton on cars Boston for distribution inland, through the season.

Anthracite—Demand all-rail is steady and consistent, but by reason of so much tonnage having been taken in March the volume for this month is less than would be considered normal for April. Retail trade is remarkably good, and there are increasing indications that consumers in general will make the effort to get their coal early. If this can be done throughout New England there is no doubt it will help very much in the season's distribution of fuel.

NEW YORK

Marine strike settlement creates heavy demand and will result in more coal coming to tidewater. All of the domestic sizes wanted, with egg and stove leading. The anthracite steam sizes holding firm with the market becoming stronger. Bituminous firm with demand good and prices steady. Dealers look for a busy summer.

Anthracite—The ending of the marine strike in this harbor has put the trade on a substantial basis. Demand at once strengthened and dealers were anxious to fill their bins, a majority of which were near depletion after a partial tie-up of shipping for seven weeks.

The settlement of the strike resulted in a rush of boats to the various loading ports. Carrying rates from the harbor are quoted at about 50c., which is a slight increase over the rates in effect before the strike.

With harbor deliveries back to normal shipments from the mines to this tidewater are expected to increase materially within the next week, and the line trade which has been receiving the bulk of the production will be expected to accept a reduced tonnage hereafter.

Trade during the last half of the week was practically at a standstill in this harbor. Shipping was irregular and there was little towing accomplished. Most of the docks were congested either by filled bins and cars or loaded boats waiting to be taken to destination. The situation at the upper docks was somewhat better than at the lower docks because of the shorter towing distance to the dealers' yards and the ability of the railroads to deliver barges with their own tugs.

Shipments to Boston and other New England points which have been made from Port Reading during the war will be resumed on May 1 from Port Richmond, Philadelphia, as the result of an order issued by the Railroad Administration. This will result in 11 tugs and 72 large barges which were transferred to this harbor from Port Richmond during the submarine scare along the Atlantic Coast returning to their former base of operations, and is said to

be one of the results of the strike in this harbor. It also means a considerable loss in the matter of tonnage handled here.

There is a heavy demand for all the domestic sizes, particularly egg and stove. Pea coal, which usually moves slowly in this market, is receiving considerable attention and there is not much surplus about. Some shippers are offering a small tonnage to slight concessions, but this is almost negligible.

The steam sizes are stronger and little is heard of quotations below full schedule prices. The better grades of buckwheat No. 1 are in good demand, and in much better shape than was the case a few weeks ago. Rice and barley are in fairly good condition considering that the mines are operating nearly full time and the warm weather is coming on.

Bids opened on Apr. 15 for furnishing and delivering one of the City Departments with 150 gross tons of stove coal showed prices ranging from \$10.97 to \$11.98 per ton, while offers for furnishing and delivering 1790 gross tons of buckwheat No. 1 showed prices ranging from \$6.39 to \$8, according to place of delivery.

Current quotations, white ash, per gross ton, at the mine and f.o.b. tidewater at the lower ports are as follows:

	Mine	Company Circular
Broken.....	\$5.95	\$7.80
Egg.....	5.85	7.70
Stove.....	6.10	7.95
Chestnut.....	6.20	8.05
Pea.....	4.80	6.55
Buckwheat.....	3.40	5.15
Rice.....	2.75	4.50
Barley.....	2.25	4.00

Bituminous—There is a better feeling in the local bituminous trade. Local deliveries are being made more promptly and prices are, in many individual instances, a trifle stronger than they were last week, although the general range remains about as they were a week back.

The high-grade coals are in heavier demand and to a greater extent than heretofore consumers are looking for quality, realizing that though the first cost might be more they are saving money in the long run. This condition is evident probably to a greater degree in New England than here, but dealers look for an increased demand for the better coals from local dealers as the season advances and they become better supplied. However, the fair grades are in good demand with prices steady.

There was good movement here during the latter part of the week, even though the boatmen had the harbor pretty well tied up. Private boat owners were able to operate, according to their own statements, 25 per cent. of their bottoms and consumers were in the main taken care of to the extent of their immediate needs. Loaded boats were eagerly picked up and brought good prices. There were many empty bottoms anchored near the docks, and when the strike was declared at an end everybody endeavored to push his boat in first.

Embargoes were placed on various shippers at the lower docks but these were lifted as rapidly as the coal was moved.

Proposals asked for by a city department for furnishing and delivering 5020 gross tons of run-of-mine brought offers ranging from \$5.80 to \$7.07 per ton, depending on the place of delivery.

The line trade is active and many consumers have taken advantage of local conditions to ask for larger and more prompt shipments and is storing coal. Prices for all rail deliveries are reported by some salesmen to be stronger than on the tide-water basis.

Shipping has been taking considerable coal recently, there having been a large increase in the number of vessels coming to and leaving this port.

Quotations for coal for spot delivery or on contract range as follows.

	Spot	Contract
South Forks.....	\$2.90 to \$3.25	\$2.95 to \$3.50
Cambria County (good grades)....	2.80 to 3.10	2.95 to 3.25
Clearfield County (good grades)....	2.65 to 2.95	2.80 to 2.95
Reynoldsville.....	2.65 to 2.85	2.85 to 2.95
Quemahoning.....	2.75 to 2.95	2.95 to 3.10
Somerset County (best grades)....	2.75 to 2.95	2.95 to 3.10
Somerset County (poorer grades)...	2.25 to 2.50	2.50 to 2.75
Western Maryland.....	2.25 to 2.75	2.50 to 2.75
Fairmont.....	2.10 to 2.35	2.35 to 2.50
Latrobe.....	2.10 to 2.25	2.25 to 2.40
Greensburg.....	2.35 to 2.40	2.35 to 2.60
Westmoreland 4-in.	2.60 to 2.75	2.65 to 2.75
Westmoreland run-of-mine.....	2.40 to 2.65	2.40 to 2.65

PHILADELPHIA

Anthracite business good. Shippers booked full for April, except on pea and smaller. Future prospects good. "Buy early" advertising campaign started. Holidays cut production at mines. Pea causing trouble, also steam sizes. Broken very free. Bituminous unsatisfactory. Excess coal in market. Prices fluctuate. Railroad price situation annoying. Mines on short time.

Anthracite—Such strides were made in booking business during the past week that all shippers supplying good grades of coal were practically sold up, at least for April, on egg, stove and chestnut. Most salesmen have been instructed to slow up in taking orders for prepared sizes and to devote their attention to pea and the smaller sizes. Cold and rainy weather made the dealers again divert their attention from filling cellars next winter to hurry calls for a ton or two for immediate use.

Many small dealers soon found their yards empty, as they had been slow buying, and coal is not being received in the substantial quantities now demanded. In fact a number of the larger buyers are now dangerously low on certain sizes, particularly stove coal. Due to their slow ordering it is hardly likely that the dealers will receive anywhere near the amount of coal they have ordered for this month's shipment, and already the cry is heard from some of them that the companies are holding back in order to reap the benefit of the 10c. advance.

From the shippers' standpoint the outlook for the remainder of the year is far more encouraging than at any time since the middle of April. Already many companies report that they have almost enough orders for the prepared sizes to keep them busy during the month of May. The retailers are busy, of course, but there is not the rush of the past few years. Their large orders are coming in steadily but slowly and some of them seem booked for weeks to come. They too are growing most optimistic and have faith in the future. There is little doubt now that they will be busy for at least two more months.

While the market for the larger sizes is in such good condition the operators have not ceased to worry about pea and the steam sizes. The smaller operators without storage room are undoubtedly cutting the price on pea coal. Contracts are being taken at \$4.50 for the season, but this is probably exceptional. For occasional cars less than this has been taken, these no doubt being instances where demurrage had accumulated, the coal being disposed of to prevent further loss. The dealers continue to have fair stocks of this size, and those who are buying are only doing so to meet the current demand. They are fully aware of the situation as to this size and freely predict that they will get the coal much cheaper when summer comes.

The big companies are undoubtedly holding firmly to the circular of \$4.80, and, while they report increased sales, they continue to store heavy tonnages. Buckwheat too is giving all hands much concern, and it is being offered around \$3 by some smaller houses, while the companies are insisting on the \$3.40 price on the larger contracts. Many of the latter still remain unclosed, however. Rice has been sold around \$2.25, which is the company-circular price for barley. One house reports the latter selling at "any old price." The big companies also say that they have much broken coal for sale and while this size is practically only made as called for, it is one of the most profitable sizes, and they are always anxious to make sales of heavy tonnages.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

Line	Tide	Line	Tide
Broken.....	\$5.95 \$7.80	Buckwheat.....	\$3.40 \$4.45
Egg.....	5.85 7.70	Rice.....	2.75 3.65
Stove.....	6.10 7.95	Boiler.....	2.50 3.50
Nut.....	6.20 8.05	Barley.....	2.25 3.15
Pea.....	4.80 6.40		

Bituminous—Trade conditions are not at all satisfactory, as lately far more coal has come on the market than could be disposed of readily. Much of this arrived at this market because of the labor troubles on the docks at New York, making it almost impossible to ship coal in that direction via the usual routes. Strong efforts have been made to dispose of some of the tonnage locally, but with little success. Good coals were in fair demand, but the ordinary grades gave the shippers much trouble.

Consumers have not let up in their inquiries for contract prices, but seem to be more after information than anything else. They are in position to drift along with

the stocks they have on hand, with the hope that they can strike a lower figure before making a contract commitment for their future needs.

The difficulty over railroad fuel seems to be as far from settlement as ever. Recently there were intimations that the railroads were prepared to ask for bids on a new basis, only to have the instructions cancelled afterward. While the companies have been depending on their stocks for most of their fuel, they have lately begun to take fair tonnages from the shippers. These are being purchased on the basis of a readjustment of price after the present controversy has been adjusted. Not many shippers are anxious for the business under such conditions and they are inclined to be quite critical of the persons responsible for the situation.

It is difficult to give a schedule of prices that would be fairly representative, as the fluctuations at times are quite variable. For instance, a mine may start with fair orders ahead and thinking that other new business might spring up will turn out an excess of tonnage, and the demand not materializing, will be compelled to market at a loss. However, the following list gives an intelligent and fair estimate of the price situation:

Georges Creek Big Vein.....	\$3.00 @ \$3.10
South Fork Miller Vein.....	2.90 @ 3.05
Clearfield (ordinary).....	2.70 @ 2.90
Somerset (ordinary).....	2.55 @ 2.75
Fairmont lump (ordinary).....	2.35 @ 2.50
Fairmont mine-run.....	2.25 @ 2.35
Fairmont slack.....	2.15 @ 2.25

BALTIMORE

Better times in coal trade are indicated despite present light demand and unsatisfactory spot prices. Exports increase and inquiries growing. Hard coal men busy.

Bituminous—The soft-coal handlers here are full of confidence as to the general future and are even encouraged concerning the very near future. This despite the immediate situation which is marked by a light demand and offerings on spot coals off the prices which the trade realizes must be maintained in general to uphold a profitable figure on mining. On contracts this feeling is still reflected by refusal to give quotations below the old government maximums. Contract closings continue rather sparse, and most consumers in need of immediate coal are out in the spot market. There is however a growing line of inquiry as to contracts and the trade is confident that a large number of consumers now relying on the open market will soon be seeking the cover of contracts.

The government departments are also out in this market for additional supplies, the Proving Ground at Aberdeen, Md., and the Edgewood Arsenal wanting jointly some 42,000 tons of bituminous, and the Fort McHenry Army Hospital at Baltimore seeking about 48,000 tons. For some time past the trade here has been relying on a pick-up in the export business to absorb some of the oversupply of coal in the domestic market, and with the arrival of a number of bottoms for that trade during the last two weeks the improvement began. The first Custom House tonnage announcement made since the war at this port showed seven clearings between Apr. 8 and Apr. 12, with a total of 22,207 tons of cargo coal and 2895 tons of bunker coal. Two ships went to Brazil, two to Cuba, two to Holland and one to Peru.

Anthracite—Hard-coal men continue busy. The first heavy rush of customers to take advantage of the cut of 40c. per ton off the retail rate of last winter caught some of the coal men unprepared, and there was a shortage of certain sizes in some yards. Orders sent to mine connections quickly brought results, however, and since the first week in April the trade has been busy with deliveries. The number of incoming orders has let down for the time being, but there is already much business on the books. Possibly a larger proportion of the business than for years is on a cash basis, to take advantage of the rule of 25c. a ton off for cash within 10 days of delivery of the coal.

Lake Markets

PITTSBURGH

Chief favorable feature is that time is passing. Prices and operating rate practically unchanged.

The coal market of the Pittsburgh district has experienced no improvement in the

past week, but operators receive some encouragement from the fact that at any rate time is passing, and the passage of time involves the further reduction of stock piles as well as the nearer approach of the period of heavy lake coal shipments. Lake coal has been going forward in an extremely limited way for three or four weeks past, while the really heavy movement is not expected until summer.

Coal prices are being as well maintained as formerly. That there is a considerable measure of strength in the foundation of the market is shown by the refusal of operators to make contracts at prices as low as are often accepted for prompt deliveries. On contracts \$2.35 is but little departed from in the case of steam coal, while in gas coal that figure is well maintained. By-product coal has not developed an active trading market for any proportions, and nominally it is held at \$2.35 for either prompt or contract deliveries but if any important contracts were to be placed by-product coal would probably develop a market level at materially less than gas coal.

Prospects of demand are no brighter. Domestic coal shows no prospect of improvement, while as to the steel industry, it is operating at a lower rate each week and shows no disposition to make lower prices for the purpose of stimulating demand. Leading steel producers do not seem to think the time is ripe for increasing sales by reducing prices, and will probably maintain the present prices until June.

The market is as follows: By-product coal, largely nominal, mine-run, \$2.35; high grade gas coal, \$2.10 @ 2.20; mine-run, \$2.35; 3-in., \$2.50 @ 2.60; 14-in., \$2.60 @ 2.70; steam coal, slack, \$1.90 @ 2.00; mine-run, \$2.00 @ 2.35, all per net ton at mine, Pittsburgh district.

BUFFALO

Bituminous not improving. Lake trade depresses slack prices. Some big mines closing. Car shortage showing. Predictions of better business by August. Anthracite more active. Lake trade opening.

Bituminous—The demand for steam coal does not improve. Consumers seem bound to use up their supplies before they buy again, though jobbers are advising them of the risk of holding off, because a possible car shortage or a sudden rush to buy when the stocks are gone may at any time cause a bad panic. Such a state of things now appears on the face improbable, but a general return of business activity would surely cut down the car supply, and then the market would stiffen.

Some shortage of cars is already reported, mostly caused by the ordering of steel hoppers into the steel trade and by the increased movement to the lakes. The main demand along the lakes being for the three-quarter lump, the mines are making a large quantity of slack and are anxious, of course, to dispose of it. This is making the market for slack extremely limp. The Canadian trade is quiet, but if the Dominion government takes care of the bituminous coal that was purchased by anthracite retailers as a substitute for that fuel—and that is what was promised—then the trade in bituminous should improve.

The price of bituminous sizes holds well, but slack is off, quotations being \$4.65 for Allegheny Valley, all except slack; \$4.45 for Pittsburgh and No. 8 lump, \$4.20 for mine-run from the same bed, and \$3.80 for all slack, per net ton, f.o.b. Buffalo.

Anthracite—The situation does not change much. Shippers find the demand so good on all-rail routes that they are obliged to cut out most of their loading to the lakes. Some of them have been a week putting in their latest cargoes and none of them is as active as they usually are at the opening of navigation. So far about 50 cargoes have been loaded, and several coal-laden steamers have sailed, but the movement is small yet, on account of the lack of down freights. Some grain is offering and possibly the season will be in full activity before the fleet is ready to return. The clearances show seven cargoes, aggregating 63,760 net tons, all for head-of-the-lakes ports.

The local price of anthracite remains as follows to the end of April:

	F.o.b. Cars, Gross Ton	At Curb, Net Ton
Grate.....	\$8.55	\$10.25
Egg.....	8.45	10.20
Stove.....	8.70	10.10
Chestnut.....	8.70	10.50
Pea.....	7.00	9.05
Buckwheat.....	5.70	7.75

With 25c. additional for loading to lake vessels.

CLEVELAND

Opening of the lake season has transformed conditions in the No. 8 district so that some mines now are reporting a labor shortage. The demand for lake coal is the heaviest in years for this season of the year with the possible exception of 1918. Steam-coal consumption in Northern Ohio now is at a new low mark, with buying in proportion.

Bituminous—Operations in the iron and steel industry in Northern Ohio—the largest single user of coal in that district—now are as light as in 1914, just before the war, and in some cases lighter. This condition naturally is reflected in the coal market. Even though stockpiles are nearing the point where it will be dangerous to defer buying much longer, industrials will not even discuss purchasing or prices, and it is doubtful if a 25c. cut under present prices would move much coal.

Yet in the face of this seeming discouraging situation, operators here are more cheerful than in weeks. Upper lake dock interests are hard after No. 8, 3-in. lump, and some operators have covered for a large percentage of their summer's output. No. 8 operators have "sold" upper lake dock men on the proposition that later on coal is going to be scarce, and that it will be the part of wisdom to crowd all bituminous possible up the lake early in the season.

Labor is getting more and more restless in southern and eastern Ohio. With prospects of wage discussions coming soon, operators appear determined to get out as large a tonnage as possible this spring. Some of the larger retail dealers are reported to be buying heavily, feeling confident prices will go no lower. They are buying high-grade coal at \$2.15 and \$2.20, compared with \$2.60 under Government regulation. These prices so far have not proved tempting to steam-coal users, but resumption of business will see a rush to cover, and the forecast is that sometime over night prices will advance beyond expectation.

Quite an appetite for both anthracite and Pocahontas is being evidenced. The buying movement has not been passed along to consumers so far. Anthracite prices, of course, advance beginning May 1, and every retailer is certain his supplies of Pocahontas will cost him more in the fall.

Lake Trade—Though it was generally expected that 50c. to Milwaukee and other Lake Michigan ports, and 42½c. to Duluth and Superior, would be the lake coal freight rates this season, instead of 55 and 48, respectively, for last season, the rate matter has been entirely opened by the Railroad Administration. This awakened operators to the realization that Government control has not been shaken off altogether.

Cleveland coal prices, per net ton delivered, are:

Anthracite:		
Egg.....	\$10.85 @	10.95
Chestnut.....	11.00 @	11.15
Grate.....	10.90 @	11.05
Stove.....	10.90 @	11.05
Pocahontas:		
Lump.....	7.50	
Mine-run.....	7.20	
Domestic Bituminous:		
West Virginia splint.....	7.05 @	7.15
No. 8 Pittsburgh.....	6.10 @	6.25
Massillon lump.....	6.90 @	7.05
Steam coal:		
No. 6 slack.....	4.40 @	4.50
No. 8 slack.....	4.70 @	4.85
Youghiogheny.....	4.90 @	5.05
No. 8, 4-in.....	5.35 @	5.50
No. 6 mine-run.....	4.40 @	4.50
No. 8 mine-run.....	4.70 @	4.85

DETROIT

Sales of bituminous coal are few in both the steam and domestic branches of the trade.

Bituminous—Should the stagnation of the Detroit market continue, developments troublesome for buyers are quite likely to occur according to the expressed judgment of Detroit wholesalers. The prediction is made that buyers, who, for one reason or another are holding back, will all be coming into the market together in the late summer or early fall, and the result will be a shortage in supply.

Neither the users of steam coal nor the retail dealers appear to be developing a receptive attitude toward buying. Jobbers say orders are few and come irregularly and, in most instances, are of small size. They declare that business could scarcely be more unsatisfactory. Some of the retailers are taking domestic lump in one or two car lots, conditional on immediate shipment, to enable them to get the coal to customers before domestic buying ceases.

The unwillingness of buyers to release

orders is attributed by the jobbers to the large supplies of bituminous that are still to be found in the yards of steam plants and retailers.

The steam-coal users, in some instances, are said to be waiting because of a feeling of uncertainty concerning the stability of prices, though a larger proportion of them is delaying buying to afford opportunity for clearing their yards of stock which they do not desire to mix with the better grades of steam coal now obtainable from their normal sources of supply. The retailers are reluctant to add to their already large stocks of bituminous, as in doing so more of their working capital would be tied up for several months.

Interest in contracts is lacking. Prices quoted in connection with the few inquiries received are said to be those fixed by the fuel administration. On day-to-day business, however, small sizes are offered at a lower basis. The reduction on slack is reported as much as \$1 a ton below the Government price. The latter is generally maintained on lump and prepared sizes.

Anthracite—Domestic consumers are not displaying much alacrity in stocking up with anthracite for next winter's needs. Despite the impending advance in price, only a few of the householders are buying now. The supply in the hands of dealers is adequate.

COLUMBUS

A turn for the better is shown in the Ohio coal trade. Demand is improving and a better tone is exhibited. The screenings situation is not so bad as formerly, owing to a reduction in lump production and a better demand for the small sizes. Prices are still uncertain.

The Ohio coal trade shows a distinct improvement from the previous week, and consequently more optimism is in evidence on all sides. There is a good demand for the fancy grades such as Pocahontas and splints, and many operators have their output sold for a month ahead. The railroad fuel situation is still hanging fire.

Bids to supply fuel for the month of April were opened recently by quite a few railroads in this territory. No announcement has yet been made as to tonnage awarded and prices. Some low prices were quoted, but generally speaking the larger concerns upheld quotations. When the railroad fuel question is adjusted it is believed the entire trade will be stabilized. Iron and steel plants are increasing their requisitions slightly and general manufacturing appears to be improving.

The domestic trade is quiet, as is usual at this time of the year. Retailers are only doing a small business and their stocks are generally sufficient for the present. Dealers are buying the better grades quite actively. Retail prices are being shaded to a certain extent but not sufficient to demoralize the market. Many dealers believe that there will be a strong demand early in the stocking season and are making preparations accordingly.

The lake trade is slow in opening, as was predicted. Officially, navigation opens May 1, but some cargoes have been loaded. Shippers are not making large lake contracts as the price question is still unsettled. Shippers who control docks in the upper lake region will start soon, but the main bulk will not be moving until after June 1.

CINCINNATI

General market conditions satisfactory, though no great demand is yet in evidence.

Conditions in the Cincinnati district remain about as they have been for the past several weeks, with only a comparatively light demand, although in some instances dealers are reporting slight indications that the situation will improve in the near future. The renewal of contracts for steam grades, which has occupied the attention of the trade for some time past, has shown a tendency to fall off to a certain extent, undoubtedly due to the uncertain conditions prevailing in some of the industrial lines.

While industrial conditions in this district are generally reported as fair, few, if any, of the factories are working up to their full capacity, while some of them have appreciably slackened. This condition naturally has its depressing effect on the demand for fuel. It is the consensus of opinion among business men generally that with the signing of the peace pact confidence will be restored and business will gradually adjust itself to more nearly normal volume, while some few predict a real boom stage when the retarding influences are removed. The local trade is confidently looking forward to the future, but in the meantime would appreciate any influence which would effect an immediate improvement.

Contrary to the general expectations the dealers supplying the domestic trade find themselves confronted with a slight, though very satisfactory increase in demand. It was the opinion of most of them that as a result of the mild weather during practically the whole winter, and the fact that the people had prepared for an entirely different brand of weather by laying in a large supply of coal last summer and fall, the demand would show a large decrease. However, they are pleased to find themselves mistaken. Altogether, the present state of the market may be described as satisfactory, all things considered.

LOUISVILLE

Eastern Kentucky operators increasing production and meeting with good demand. Western Kentucky trade finding things dull, due to close differential in prices as between grades.

Eastern Kentucky operations are now up to a 65 to 70 per cent. full-time basis, there being an active demand for steam coal as well as a fair demand for domestic grades. The better grades are getting the call, and the operators in that section are feeling optimistic. The demand for steam coal is picking up steadily, both mine-run and nut and slack showing movements. Domestic demand is not so strong as it was, but many retailers are beginning to buy and stock some coal.

In Western Kentucky the mines are doing a little less than 40 per cent. as a whole, due to there being little demand for lower grades when the market is fully supplied with the better eastern Kentucky stocks. Operators from the western section of the state are feeling a bit optimistic just now, especially in connection with the outlook for block coal. However, a fair volume of nut and slack as well as mine-run is moving.

Prices are being well maintained throughout the fields, there being little quoting except for April, May and June delivery on domestic coal. Several good railroad contracts for engine coal are about to be closed, and prospects are generally good in connection with the lake outlook.

Eastern Kentucky is quoting block at \$2.85 to \$3; Jellico grade, \$3.25; egg, \$2.75; mine-run, \$2.40; nut and slack, \$2; Western Kentucky is quoting block and egg, \$2.60; mine-run, \$2.35; nut and slack, \$2.05.

BIRMINGHAM

Domestic coal moving well but steam demand slack. Prices remain firm. Mines operating on three- and four-day schedules, but a better average daily output is being obtained.

Coal men report a sustained demand for all grades of good domestic coal, the supply of which is short even at this early season, and the lower grades of domestic fuel are now being taken by dealers, who are beginning to show some accumulation of stocks in their yards. Domestic mines are running full time, though the output is not up to normal. Prices are as follows per net ton at mines for lump and nut:

Carbon Hill.....	\$3.15
Corona.....	3.40
Big Seam.....	2.90
Black Creek and Cahaba.....	3.85 @ 4.50
Montevallo.....	5.00

There has been no noticeable improvement in the steam situation, those consumers who do have contracts in force buying as their needs materialize. Sales are confined to small lots and few contracts are being made. Sales agents and jobbers, however, are in no wise pessimistic and are confident that a good market will develop as soon as industrial conditions become more settled. Government prices in effect Jan. 31 still obtain for steam coal.

Coke

CONNELLSVILLE

Market continues to decline. No sale for byproduct coal. Heavy restriction in Connelville coke output.

The Connelville coke market has continued to exhibit a declining tendency, prices being a shade lower both on spot lots and on deliveries to the end of the month, while it develops that more contracts were settled at \$4 and fewer at \$4.25, for April deliveries, than was originally reported.

How much liquidation in production costs there has been cannot be estimated. It is known that there is considerably more efficiency, and it is rumored that wage reductions at small operations have been fairly

numerous. The large operators have not made any reductions whatever. While coke is now available at prices considerably below what was recently claimed to be the cost of production, it does not follow that actual losses are being experienced, since the cost computation was based on coal at the market price, and that market price would represent a profit, the difficulty being that coal cannot be sold in any tonnage at the market.

The Connellsville coke industry has had to stand the brunt of the reduction in blast-furnace operations, by reason of there being so many steel interests that use both byproduct and beehive coke when they are running full, but when blowing out furnaces shut off the beehive coke before they touch their byproduct operations. On the other hand the Connellsville operators are not experiencing any competition in the market from byproduct ovens, coke supply being too limited to enable the byproduct ovens attached to blast furnaces to attempt to dispose of surplus coke to other furnaces. The result of the decreased coke consumption falling particularly upon the Connellsville region is that production is now running not over 150,000 tons a week, whereas in July, August and September, before the influenza epidemic affected production, the weekly output ranged from 325,000 to 350,000 tons, so that there has been a decrease of about 55 per cent.

Odd lots of furnace coke have been available at \$3.60, and this price has also been quoted on deliveries to the end of the month. There is a rumor current that the remarkable price of \$3.30 has been reached, and this may be correct if it involved coke of such character that it could be used by very few furnaces. April settlements appear to have been chiefly at \$4, with a few at \$4.25. Deliveries continue, in a limited way, on contracts that were written at "last Government price" but voluntarily reduced to \$5. Foundry coke remains at \$4.50@6.00, depending on brand, with fairly good demand in small lots. All prices are per net ton at ovens.

The "Courier" reports production in the Connellsville and Lower Connellsville region in the week ended Apr. 12 at 150,415 tons, a decrease of 21,935 tons.

Buffalo—The trade is decidedly quiet and will remain so till the iron trade is more settled, for then the ore contracts and charters for distributing the Lake Superior output will be made and the regular season will open. As yet nothing in that line has been done and all vessels that have gone after ore will merely carry some that was left over last fall or on long-term contracts that they may have. The price of coke, f.o.b. here is \$7.25 for 72-hour foundry, \$6.60 for 48-hour furnace and \$6.10 for off grades. Breeze and other fuel cokes are practically unsalable.

Middle Western

GENERAL REVIEW

More sales being reported, opinion being strong that market will show steady improvement from now on. Prices holding up. Domestic demand inactive.

There has been little change in the Midwest market during the past week. However, what difference exists is for the better. Operators and jobbers alike are reporting more sales, and at reasonable prices. There is a prevailing opinion that from now on the market will improve slowly but steadily. Practically all of the large operators in this district received bids calling for their best contract propo-

sitions to supply coal to the various army camps and stations in this territory. Careful investigation shows that nearly all the operators making bids for this business have kept strictly to the late Government prices. A number of operators decided not to make any bids for the business, on account of the red tape involved in the making of a contract with the Government. Some also said that contracts with the Government are entirely too one-sided, favoring, of course, the Government.

Prices are holding up fairly well. While there has been but little demand for Franklin County screenings, we understand the prices on this grade of coal have been maintained steadily, and without deviation. Other southern Illinois coals, especially from the Belleville district, have been selling at cut prices. This is also true of coal from the northern districts of the state, and the Springfield district, considering the Springfield region as a whole, has maintained the price on its product remarkably well. The high-grade producing districts in Indiana continue to adhere strictly to list prices and report considerable business received on this basis.

The domestic situation in this territory, and especially in northern Illinois, is inactive. This is because practically all householders have some coal in their bins. Those who ran out of coal purchased late in March, or before, and as a result are no longer in the market. Dealers report that their trade show practically no inclination toward stocking coal. This means, of course, that there will be a congestion later in the season.

CHICAGO

Much "distress" coal dumped here. Good demand for Pocahontas. Why public is paying high prices for coal.

The Chicago steam market is not improving so fast as had been hoped, and Chicago continues to be a dumping ground for "distress" coal. The domestic situation is quiet in the extreme. There is a good demand for Pocahontas, and we understand that the price on this coal is holding firm at \$3.50 to \$3.75 for lump. There is a prevailing opinion among the retailers that when this country begins to export coal but little Pocahontas will reach this market.

Mr. Upham, the president of the Consumers Co., issued a statement to the public wherein he claimed that the high prices for coal are entirely on account of Government supervision. He says that the retailers are not the coal profiteers, but that the United States is to blame for the high prices. To give an idea of his argument, we quote the following paragraph:

"Take bituminous coal, an Illinois product. Price fixed by the Government at \$2.50 per ton at mines. The freight rate, which was 90c. per ton, is now \$1.55, plus a 5c. war tax, which brings the retail price up to \$4.10 per ton, more than the retail price before the war. Teaming was then 70c. per ton, and is now \$1 per ton. We allow 55c. for shortage, yardage and profit, and pay the \$1 teaming charge to the men. That brings the price of Illinois coal up to \$6 per ton."

MILWAUKEE

Prospect of higher prices for anthracite serves to stimulate the demand. Early agitation in favor of the establishment of municipal coal yards.

Newspaper gossip, suggesting a possible advance of \$1.50 per ton on anthracite over present prices, has had the effect of stimulating business to some extent. Dealers report a tendency on the part of domestic consumers to put in supplies for next win-

ter, with the result that deliveries are more active than for some time past. Other conditions remain the same. There is plenty of coal on hand, and cargoes will be reaching the docks from the lower lakes in the course of a few days, but there is no sign of price shading even on the commonest bituminous grades. The prospect that coal will be no cheaper, with the strain of war's needs removed, naturally causes dissatisfied comment, and public agitation of the matter may be expected. Mayor D. W. Hoan is in the field early with an argument in favor of the establishment of municipal coal yards, not only in Milwaukee, but at interior points.

ST. LOUIS

An easy, quiet and unattractive market, with plenty of coal and no orders. Steam and domestic city and country business quiet.

Local conditions are extremely easy. The weather is mild and there is but little demand for domestic fuel. Such orders as come in are for small amounts only and for the cheaper grades. A few orders have been placed for storage coal for household use, but these are scattered. The wagon-load steam business is easy on account of the slowing up in activity on the part of manufacturing plants.

The country demand for all kinds of coal is practically off, except on nut for range purposes in the smaller places. There is some call for anthracite chestnut, but other than that there is little coal moving.

In the Standard district business is at a standstill. The trouble right now is to move lump and egg. Nut and screenings are in fairly good demand, but even at that the operators do not seem to realize that they can get the cost of production, and lower prices still prevail.

In the Mt. Olive field conditions are tranquil. Mines are working a couple of days a week, as in the Standard field. The coal here is moving to the north. There is little coming in locally. There is a little railroad coal moving, but it is light, and there is some question as to the price.

In the Cartersville field of Williamson and Franklin Counties, as well as in the Du Quoin field, things are moving along slowly but apparently satisfactorily to both miner and operator. Some mines manage to get a couple of days a week, and some of them do better than that; others have been shut down for some time, and a number are expecting to shut down to make necessary repairs.

No Arkansas coal is coming in, and judging from the attitude of the dealers little will come in, even if the mine troubles in that state were settled. There is no demand for smokeless, although none is offered for this market.

The present prevailing circular per net ton f.o.b. mines is:

	Williamson and Franklin County Association:	Mt. Olive and Staunton	Standard
Lump, egg and nut...	\$2.75	....	....
Washed Nos. 1 and 2 nut...	2.85	....	....
Independent:			
Lump, egg and nut...	2.55	2.55	Lump and 2 25 egg
Washed Nos. 1 and 2 nut...	2.85	....	2x3 nut 2.00
Mine-run...	2.35	2.20	2.00
Screenings...	2.20	2.05	1.75
3-in. lump...	....	2.30	....
2-in. lump...	....	....	2.15
2x6 egg...	....	....	2.10

Williamson-Franklin rate to St. Louis is \$1.07; other rates \$0.92.

Coal and Coke Securities

New York Stock Exchange Closing Quotations Apr. 21, 1919

STOCKS		TICKER		BID		ASKED		BONDS		BID		ASKED	
American Coal Co. of Allegheny.....	(ACL)	45						Cahaba Coal, 1st Gtd. 6s, 1922.....		90			
Burns Brothers, Com.....	(BB)	163 1/2		164 1/2				Clearfield Bituminous Coal, 1st 4s, Ser. A, 1940.....		71			
Burns Brothers, Pfd.....	(BB)	110		115				Colorado Fuel & Iron, Gen. 5s, 1943.....		80 1/2		91	
Central Coal & Coke, Com.....	(CK)	55						Colorado Indus. 1st Mtg. & Col. Tr. 5s, 1934.....		73 1/2		74 1/2	
Central Coal & Coke, Pfd.....	(CK)	63						Consolidation Coal of Maryland, 1st Ref. 5s, 1950.....		87		88 1/2	
Colorado Fuel & Iron, Com.....	(CF)	43		43 1/2				Lehigh Valley Coal, 1st Gtd. 5s, 1933.....		96			
Colorado Fuel & Iron, Pfd.....	(CF)	105		125				Lehigh Valley Coal, Gtd. Int. Red. to 4%, 1933.....		100 1/2			
Consolidation Coal of Maryland.....	(CGM)	75						Lehigh Val. Coal & Nav. Con. S. F. 4 1/2s, Ser. A, 1954.....		79 1/2			
Elk Horn Coal, Com.....	(EH)	26 1/2		27 1/2				Pleasant Valley Coal, 1st S. F. 5s, 1928.....		90			
Elk Horn Coal, Pfd.....	(EH)			47				Pocahontas Coal & Coke, Joint 4s, 1941.....		80 1/2		84 1/2	
Inland Creek Coal, Com.....	(ICR)	39						Pocahontas Con. Collieries, 1st S. F. 5s, 1957.....		83 1/2		88	
Inland Creek Coal, Pfd.....	(ICR)	75						Roch. & Pitta. Coal & Ir., Helvetia Pur. Money 5s, 1946.....		87 1/2		88	
Jefferson & Clearfield Coal & Iron, Pfd.....	(JF)	60						St. L., Rocky Mnt. & Pac. Stamped 5s, 1953.....		98			
New Central Coal of West Va.....	(NCC)	5						Tenn. Coal, Iron & R.R., Gen. 5s, 1951.....				83	
Pittsburgh Coal, Com.....	(PC)	50		50 1/2				Utah Fuel, 1st Sinking Fund 5s, 1931.....		92		95 1/2	
Pittsburgh Coal, Pfd.....	(PC)	86 1/2		87				Victor Fuel, 1st Mtg. Sinking Fund 5s, 1953.....		87		70	
Pond Creek Coal.....	(PD)	13		15 1/2				Virginia Iron, Coal & Coke 1st 5s, 1949.....		65		85 1/2	
Virginia Iron, Coal & Coke.....	(VK)	53 1/2		56						84			

* Ex. Div.